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PART I.

ORIGINAL COMMUNICATIONS.

A Sketch of the Agricultural History of South-Carolina; being a communication read before the Agricultural Society of St. John's, Colleton, by B. R. CARROLL; *and published at the request of the same.*

GENTLEMEN—

SINCE the time, you conferred upon me, the flattering testimonial of honorary membership of this Society, it has not been in my power to return such an acknowledgment of the favor, as I could have desired. When, I tell you, that, I regard this Society, as equalled in usefulness by few in this country, and surpassed by none; I, in some measure, express how highly I appreciate the honor which it has conferred. In hopes of returning a very small part of the obligation which you have thus bestowed upon me, I have devoted a portion of my time in preparing a communication, which, I have flattered myself, might be listened to with some interest by this Society. I trust, that the hurried manner in which it has been prepared, will plead a sufficient apology for any inaccuracies which it might contain.

That, the wealth and commercial importance of a country, depend mainly upon its agricultural resources, has become one of the clearest axioms of political economy. The agricultural history of no State illustrates this truth, more strikingly, than that of South-Carolina.

From its first settlement, South-Carolina was designed to become an agricultural State. With this intent, the

Lord Proprietors of this province, had as early as the year 1668, sent out William Sayle, to explore its entire coast, and to select a territory better adapted to the purposes of cultivation, than the lands about Albermarle and Cape Fear, which places, they had previously settled. After a diligent exploration of the coast, Sayle made a report to the proprietors, which resulted in the selection of the Southern part of the province, then known under the general name of Carolina. In 1670, the proprietors, at considerable expense, sent out two ships, with a small body of emigrants, well provided with provisions, cattle and seed, and every implement necessary for the cultivation of the soil. Their first settlement was at Port Royal; but, as is well known, the emigrants left this place the subsequent year, and betook themselves to the west bank of Ashley river, where it was found they could procure better pasturage for their cattle and horses.

It was naturally enough inferred, that, as Carolina corresponded very nearly in latitude with the southern portions of Europe, the fruits and grain common to those places, might be successfully cultivated here. In this supposition, however, they were disappointed. Experience, which is the only unerring test in agricultural experiments, soon taught them, that while they had with sufficient care consulted the similarity of latitude and climate, they had entirely neglected to consider the nature and quality of the soil they were to cultivate. Instead of finding the high, rich lands of their own country, they discovered, in their new location, a soil, rich enough, indeed, but for the most part, low, sandy and sour. To attempt the cultivation of wheat, rye, barley, or any other European grain, upon these, was next to useless. Besides, the whole country was so thickly wooded, and so difficult to clear, and even when cleared, so apt to grow up rapidly in the weeds and grass common to the country, that, if the seed which was put in the ground did germinate, it required more labor than they could bestow, to keep the harvest from being overrun with weeds. Such were their difficulties, in this respect, that the emigrants soon became discouraged. Borrowing the idea of Christ's parable of the sowers, they wrote back to the proprietors, that "although they had not slept, and had been always watching, yet it appeared to them, that the enemy had come, and had sown tares among their wheat; for, when the blade was

up, and brought forth fruit, there also appeared so many tares, that it was impossible for them, with all their diligence, to separate the one from the other."*

With the exception of a few culinary vegetables, for the first twenty-four years after the settlement of the province, every thing like cultivation of the soil was neglected. The settlers contented themselves with exporting lumber and peltries of various kinds. Under this state of things, it was unreasonable to expect that the people would pay any more attention to agriculture, than their own immediate wants required. Their cattle were accordingly turned loose in the woods to shift for themselves; and some idea of the luxuriance of the pasture, and its complete adaptation to the purposes of grazing, may be collected from the fact, that in less than ten years from the foundation of the colony, large quantities of beef, pork and mutton, were exported to the West-Indies and the colonies of the North. It was, perhaps, in no language of exaggeration, that a writer of that day states, that "an ox or a cow could be raised in Carolina with as little expense, as a hen or a chicken in England."†

It appears from the same quaint writer, we have just quoted, that about this time, 150 mares and horses were imported into the province from New-York and Rhode Island. "These," says he, "breed well; and the colts they have are finer limbed and headed than are their dams or sires, which gives great hopes of an excellent breed of horses, as soon as they have gotten good stallions among them."

The West-India Islands, about this time, having a great demand for all kinds of meat, the Carolina planters, with the view of supplying those markets, were now induced to give their almost exclusive attention to the raising of stock. The proprietors, perceiving to what a disastrous result this species of trade would in time lead them, in reply to a demand from the colonists for more cattle, wrote them a positive refusal; "because," said they, "we wish not to encourage graziers, but to fill the country with planters." From this refusal to supply them with cattle, the colonists were now convinced of the necessity of turning their attention more particularly to agri-

* Chalmer's Pol. Annals of Carolina—2 vol. Hist. Col. So. Ca. p. 332.

† See Account of Carolina in America—Hist. Col. of So. Ca. vol 2, p. 29.

culture; and from this period we may date the prosperity of Carolina. She was now taught the important lesson which perhaps resulted in her final independence; that a nation to be prosperous and happy, must depend mainly upon its agricultural labor and industry.

We have seen that the attempt to cultivate the European grains, had entirely failed in Carolina. Happily, however, for the settlers, they had now learned of the Indians how to cultivate the maize, or Indian corn; and not long after, from the same source, the *batata*, or sweet potato, was introduced into their husbandry. These two esculents, so important to the prosperous condition of our plantations, are supposed to be indigenous to the soil. In the earliest written accounts of this country, mention is made of their existence; and the Indians of Carolina could recollect them as food, as far back as the memory of their oldest traditions could go.

These productions, however, for a long time, served only to supply the domestic wants of the colonists. The woods still continued to furnish them with the means of carrying on their foreign exchanges. In addition to the bears, beavers, wild cats, racoons, deer, and other animals, which furnished them with skins, the fields, which they had cleared, yielded them tar, turpentine, rosin, and medicinal roots, with various species of lumber, to export to Europe and the West-Indies.

The profitable trade, which the above named peltries opened, induced the Indians to turn their attention to the means of procuring them. When first discovered, the habits of these people were essentially agricultural. Having a more fertile soil than the rude tribes of the North, they were enabled to cultivate many vegetables and grains, which the more unfavorable climate of a colder region would not permit. Many of them had large granaries well filled with corn; and the instances were not unfrequent, where they liberally supplied the emigrants from their abundant store-houses.* Their agricultural occupations rendered it necessary for them to locate themselves within certain limits of territory, which they built upon, and divided into extensive fields. Hence, among them were to be found villages and towns, well built; the inhabitants somewhat experienced in the ruder arts, and

* See Hist. Col. So. Ca. vol. 1. p. xliii.

in their notions of government, law and morality, considerably advanced in civilization. Their intercourse with the whites soon led them from such pursuits. Finding that one day's hunt would procure them skins enough to barter for rum and food, they soon gave up the more uncertain cultivation of the soil. In a short time, their fields were abandoned, and they now knew no other occupation than that of the chase. Whether these men would ever have become skilful cultivators of the soil, has been often debated. Their proverbial repugnance to all sorts of severe labor, derived from their history in all portions of the world, almost warrant us in believing, that they would never have made any very considerable advances, beyond what their absolute necessities demanded.

In twenty-three years after the first settlement of Carolina, its population had augmented to 32,000, of which 14,000 were whites, and 18,000 blacks. It may be readily inferred, that all of this number could not be engaged in commercial affairs. Many of them were occupied in the cultivation of the soil; and happily for the colony, an occurrence took place about this time, which afforded the most ample means of giving a successful direction to this pursuit.

Landgrave Smith, who was the governor of the province in 1693, had been in Madagascar before he settled in Carolina. He, there observed how rice was cultivated. Having a piece of low ground attached to his dwelling in Charleston, he was persuaded that rice would grow therein, if seed could be procured. About by this time, a vessel from Madagascar being in distress, came to anchor near Sullivan's Island. The master of this vessel inquired for Mr. Smith as an old acquaintance. An interview took place. In the course of conversation, Mr. Smith expressed a wish to obtain some seed rice to plant in his garden, by way of experiment. The cook being called, said he had a small bag of rice suitable for that purpose. This was presented to Mr. Smith who sowed it in a low spot of his garden, which now forms a part of Longitude lane. It grew luxuriantly; and the produce of this little crop was afterwards distributed among his friends. This is the account given of the introduction into South-Carolina of rice, by the late Dr. Ramsay. It however appears from the documents, which I have examined, that rice was known to the peo-

ple of Carolina, as early as the year 1666.* The little, however, that was then planted was found to be of an unprofitable kind. Shortly after its introduction by Landgrave Smith, another parcel of the seed was sent over by Mr. DuBois, Treasurer of the East-India Company. Governor Drayton in his "View of South-Carolina," thinks, that from this seed, the distinction was first made, which now prevails between the white and gold rice.† As soon as it was found that our low swamps afforded the best soil for the cultivation of this grain, it at once became the staple production of the province. The parliamentary council voted it such, and in the short space of twenty years, its annual production had increased to 18,000 barrels. During the next ten years inclusive, its exportation had reached as many as 264,488 barrels; and in the ten subsequent years, it even doubled this latter amount. The change from the proprietary to the regal government in 1719, gave a new impulse to the spirit of the Carolina settlers. Their commerce now began to extend itself to distant countries, and their rice, having undergone the test of foreign markets, now received a preference over that of all other countries. In the space of forty three years after the first planting of rice in the province, the staple had risen to 71,484 barrels annually. With this rapid increase of our agricultural prosperity, it is not to be wondered at, that the increase of our slave labor should have been commensurate. Negroes were now annually imported, and readily sold for high prices, so that up to the year 1739, only sixty-odd years after the settlement of the province, the slave population amounted to 40,000.

Let it not be supposed, however, that rice was the only article of export. From a statement of the exports from Carolina, for the year 1739, the following appear among the enumerated articles:—

* In the "Brief Account of the Province of Carolina," published in 1666, the author admonishes the people of Carolina (North-Carolina,) to betake themselves to the cultivation of rice, because, says he, "the meadows are very proper for the same."—Hist. Col. So. Ca. v. 2. p. 13.

† See Gov. Drayton's View of So. Ca. p. 124.—In this notion, the Governor is confirmed by the authority of Gov. Glen, who in his "History of Carolina," says, that he saw the captain who introduced the first rice into Carolina, and that in acknowledgement of the services he had done that province, the gentlemen of the same, rewarded him with a handsome gratuity.—See Gov. Glen's Description of Carolina, Hist. Col. vol. ii. p. 270.

Rice,	71,484	bbls.
Pitch,	8,095	"
Turpentine,	83	"
Tar,	2,734	"
Deer-skins,	559	hhds.
Loose skins, unpacked,	1,196	
Indian-corn and cow-peas,	20,165	bush.
Pine & cypress timber & planks,	209,190	feet.
Cedar boards,	3,200	"
Shingles,	42,600	"
Cask staves,	56,821	
Tanned leather,	1,585	hides.
Rosin,	45	bbls.
Sassafras,	4½	tons.
Beef and pork,	539	bbls.
Potatoes,	790	bush.

These amounted to the aggregate sum of $700,000—a large income to a province, which as yet, had been settled only 69 years.

"History may be resorted to in vain," says one, who has examined this subject with a philosophic mind, "to find colonies so soon emerging from insignificance and dependency, to wealth and prosperity. Rome and Greece founded their cities, and planted their colonies; but it was principally from conquered countries they drew their supplies. To the eighteenth century, it was left to evince a contrary policy; by bringing into view new settlements, rising rapidly into wealth and importance; and by industrious agriculture and commerce, strengthening the revenues and navies of the country, which had originally founded them."*

Until the year 1745, rice seems to have occupied the chief attention of the planters of Carolina. About this year the Indigo plant was introduced, to which much of their attention was transferred. With such success was it cultivated, that we find two years after its introduction, 200,000 lbs. of this article exported to England. The history of this plant we shall extract from Dr. Ramsay's account.

"Its original native country, is Hindostan; but it had been naturalized in the West-India Islands, from which it was introduced into Carolina by Miss Eliza Lucas, the

* Drayton's View of So. Ca.

mother of major-general Charles Cotesworth Pinckney. Her father, George Lucas, governor of Antigua, observing her fondness for the vegetable world, frequently sent to her, tropical seeds and fruits, to be planted for her amusement, on his plantation at Wappoo. Among others, he sent her some indigo seed as a subject of experiment. She planted it in March, 1741 or 1742. It was destroyed by frost. She repeated the experiment in April, this was cut down by a worm. Notwithstanding these discouragements, she persevered and her third attempt was successful. Governor Lucas on hearing that the plant had seeded and ripened, sent from Montserrat, a man by the name of Cromwell, who had been accustomed to the making of indigo and engaged him at high wages to come to Carolina, and let his daughter see the whole process for extracting the dye from the weed. This professed indigo maker, built vats on Wappoo creek, and there made the first indigo that was formed in Carolina. It was but indifferent. Cromwell repented of his engagement as being likely to injure his own country; made a mystery of the business, and, with the hope of deceiving, injured the process by throwing in too much lime. Miss Lucas watched him carefully and also engaged Mr. Deveaux to superintend his operations. Notwithstanding the duplicity of Cromwell, a knowledge of the process was obtained. Soon after Miss Lucas had succeeded in this useful project, she married Charles Pinckney, and her father made a present of all the indigo on his plantation, the fruit of her industry to her husband. The whole was saved for seed. Part was planted by the proprietor next year at Ashepoo, and the remainder given away to his friends in small quantities for the same purpose. They all succeeded. From that time the culture of indigo was common, and in a year or two, it became an article of export. Soon after the dye was successfully extracted from the cultivated plant, Mr. Cattle made a present to Mr. Pinckney of some wild indigo which he had just discovered in the woods of Carolina. Experiments were instituted to ascertain its virtues. It proved to be capable of yielding good indigo, but was less productive than what had been imported. The attention of the planters was fixed on the latter. They urged its culture with so much industry and success, that in the year 1747 a considerable quantity of it

was sent to England; which induced the merchants trading with Carolina to petition parliament for a bounty on Carolina indigo. The parliament upon examination found it was one of the most beneficial articles of French commerce, that their West-India Islands supplied all the markets of Europe, and that Britain alone consumed annually, six hundred thousand weight of French indigo, which, at five shillings a pound, cost the nation the prodigious sum of one hundred and fifty thousand pounds sterling. It was demonstrated that this expense might be saved by encouraging the cultivation of indigo in Carolina; it was proved that the demand for indigo annually increased, and it could never be expected that the planters in the West-Indies, would attend to it while the culture of sugar-cane proved more profitable. Accordingly an act of parliament, passed in the year 1748, for allowing a bounty of sixpence per pound on indigo reared in the British American plantations, and imported directly into Britain from the place of its growth. In consequence of the act, the planters applied themselves with double vigor and spirit to that article, and seemed to vie with each other, who should bring the best kind and greatest quantity of it to market. Some years indeed elapsed before they found out the nice art of making it as good as the French; but every year they improved in the mode of preparing it and finally received great profit as the reward of their labors; while many of them doubled their capital every three or four years, by planting indigo, they in process of time, brought it to such a degree of perfection as not only to supply the mother country, but also to undersell the French at several European markets. It proved more really beneficial to Carolina, than the mines of Mexico or Peru are or ever have been either to old or new Spain. In the year 1754, the export of indigo from the province, amounted to 216,924 pounds. And shortly before the American Revolution it had risen to 1,107,660 pounds. In the revolutionary war, it was less attended to than rice. In the year 1783, it again began to be more cultivated; 2051 casks of indigo were exported, and it continued to form a valuable export for some years, but arge importations of it from the East-Indies into England so lowered the price, as to make it less profitable."

Under this state of things, indigo now gave place to cotton. The transition from the one plant to the other, was easy. Fortunately, the lands which were suited to the growth of indigo, were also adapted to that of cotton; and in a year or two, the one staple was entirely superseded by the other.

It is a fact, perhaps, not generally known, and one which none of our historians have noticed, that cotton, indigo, rice and tobacco, were all of them grown in this country as early as the year 1680. In the "Account of Carolina," printed in 1682, it is observed in speaking of Carolina, that "*Tobacco* doth grow here very well, and is nearer to the nature of Spanish tobacco than that of Virginia. *Cotton* of the Cyprus and Smyrna sort, doth likewise grow exceeding well, is fine, and good plenty of the seed is thither sent. *Indigo* thrives well, and good hath been made, and *Rice* hath good low lands to produce it, much better far, than the famed golden fields of China."

Cotton, however, is not noticed as an article of export from Carolina, until 1747. Ramsay and Drayton in their histories, make the date several years later; but in an old pamphlet on the affairs of the State, by Governor Glen, I find, among the exported articles for the year 1747, *seven bags of cotton wool*,* which sold for about $75. From that period to this, it seems to have been grown in the State. But at no time, previous to the year 1784, did cotton constitute an important article of export. During the Revolutionary War, it was raised through necessity, and with a mixture of wool or sometimes by itself, it was woven into coarse cloths, and worn by the patriots of our country.

The history of this plant might be traced almost as far back as written records go. But however interesting such an investigation would be, I am precluded from making it, by the limits I have prescribed myself.

Of the several kinds of Gosypum, or cotton, known to botanists, three kinds are principally grown in this State. The *nankeen*, the *green-seed*, and the *black-seed*. The former of these is only cultivated for domestic purposes. The two latter constitute a large part of our agricultural wealth.

The green-seed, or short staple cotton, as we have already seen, was grown at an early period in South-

* Hist. Col. So. Ca. vol. 2. p. 234.

Carolina. It was then cultivated only in small quantities by the poorer classes of the white population. The wool was separated from the seed by the old and young laboring with their fingers, as they sat around the evening fire; and was spun by the women upon the hand-wheel. In the back parts of our State, this is still the mode, of preparing the article, by the poorer farmers.

Until the invention of Whitney's cotton gin; all the cotton sent to market, was prepared by the *bow* or the *roller gin*. In using the bow, the cotton was laid upon open cradles, and by beating it with that instrument, the seed was loosened from the wool, and thus dropped below, leaving the wool behind. The roller-gin is too well known to need any description.

Perhaps, no invention has produced more benefit to our planting interest, than Whitney's cotton-gin. It may be safely said to have rendered cotton one of the staples of our country; and to have given to the Southern States, a value and importance, which it is scarcely possible they would have otherwise attained. "If," said Judge Johnson, "we should assert that the benefits of this invention exceed 100,000,000 dollars, we might speak within bounds." We would not place the estimate too high, were we to double the Judge's calculation; and, that too, only, in its application to this country. When Whitney introduced his gin in 1794, the exports of cotton from the United States were only 5,340 bales. In 1834, only a period of 40 years, our exports were 1,254,328 bales, including sea-island cottons.

The history of the introduction of the long staple cotton, is thus given by Dr. Ure in his valuable History of the Cotton Manufacture of Great-Britain. His information is derived from Mr. Spalding of Georgia. "After America had established its republican government, Great-Britain feeling bound to make a provision for those colonists who had espoused her cause in the war of independence, offered them portions of land in Nova-Scotia and the Bahama Islands. At this conjuncture, Arkwright was maturing his spinning machinery, and creating a considerable demand for cotton wool, which induced the colonists who crossed over from the Bahamas to turn their attention to the cultivation of the cotton plant, and to procure the best species of seed, then known in the world. The small isle of Anguilla in the Caribean Sea,

long celebrated for the excellence of the cotton wool raised upon it, furnished the first seed to the Bahama settlers. By the year 1785, they had succeeded in raising cotton upon two of the Bahamas, viz: Long-Island and Exuma. Mr. Spalding's father, then settled in Georgia, received from Colonel R. Kellsall, a planter in Exuma, a bag of cotton-seed; some other Georgians also received similar contributions from their former companions. Josiah Tatnall may be particularly mentioned in our history of the cotton husbandry of the United States, as a person who received a supply of cotton-seed from his father, serveyor-general of the Bahamas. From that handful of seed sent over in the winter of 1785, all the sea-island cotton plants of Georgia and South-Carolina have been produced."*

Did space admit, it would be interesting to trace the history of the cotton-plant through all of its details. It would show us that while its production has increased, from the value of $32,000, in 1792, to $61,435,746, in 1836, that the demand for it has steadily continued; and, it would moreover appear, that from the increased improvements in machinery for its manufacture, that, this staple is destined to experience little, if, any decrease, either in price or demand.

But I must proceed to the consideration of other subjects connected with our agricultural history.

Tobacco was another of the staples of South Carolina. Though known to the country when first discovered, it does not, however, appear to have become an article of export, until sometime after the revolutionary war. In a letter addressed to the colonists as early as 1674,† the proprietors earnestly recommended its cultivation; and from an extract already made, we have seen that the Carolina tobacco, was deemed as fine as the Spanish. In Cartier's voyage to America, as far back as 1555, this weed is thus described: "There groweth a certaine kinde of herbe, whereof in summer they make great provision for all the yeare, making great account of it; and only men use of it; and first, they cause it to be dried in the sunne, then wear it about their neck, wrapped in a little beast skin made like a little bag, with a hollow piece of stone or wood pipe; then when it pleaseth them, they make powder of it, and then put it in one

* Hist. Cotton Man. vol. 1. p. 101. † Hist. Col. So. Ca. vol. 2. p. 329.

of the ends of the said cornet or pipe, and laying a coal of fire upon it, at the other end, suck so long and deliciously, that they fill their bodyes full of smoke, till it cometh out of their mouth and nostril, even as out of the tunnel of a chimney." Diedrick Knickerbocker could not have described more graphically, the smoking operations of one of the most inveterate Dutch puffers.

King James did every thing in his power to discourage the cultivation of this weed in the colonies. To effect his purpose, he wrote that celebrated and whimsical pamphlet, called the "Counterblast to Tobacco." His concluding remarks almost warrant the belief that his majesty must have been once smoked in a wigwam, during an incense offering to some Indian deity: "It is a custom," says he, "loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs; and in the black stinking fumes thereof, nearest resembling the horrible Stygean smoke of the pit that is bottomless."* We forget which, but in one of the states of Europe, its use was punished by cutting off the nose of the offender.†

Tobacco was never exported from Carolina to any extent. It was cultivated mostly in the middle and upper districts, but being a very bulky article to convey to market, it never so far rewarded the planter as to induce him to turn much of his attention to it. Some idea however, may be formed of the demand for this weed, when we state upon authority, that $16,000,000 worth of the manufactured article, is annually smoked, chewed and sneezed away in the United States alone.

* Works of King James, p. 222.

† It is almost impossible for a modern to conceive the extent to which the use of tobacco prevailed, when it first came into fashion. 'No, (says King James,) it is become, in place of cure, a point of fellowship; and he that will refuse to take a pipe of tobacco among his fellows,' is accounted a rude misanthrope. Again, 'to your persons, (says he,) you have, by this continual vile custom, been reduced to this shamefnl imbecilily, that you are not able to ride or walk the journey of a Jew's sabbath, but you must have a reekie to be brought from the next poor house, to kindle your tobacco with.' Even in the reign of Queen Anne, the misses took snuff, and the old ladies chewed or smoked tobacco. Swift, in his letters to Miss Johnson and Mrs. Dingley, often mentions the subject of their using snuff, and speaks of sending Brazil tobacco to the latter, as if, like tea or chocolate, it was a matter of course. 'I have, (says he,) the finest piece of Brazil tobacco for Dingley, that ever was born;' and again, 'I have made Deleval promise to send me some Brazil tobacco from Portugal, for you, Madam Dingley.'—See Sandford's United States, p. 269.

The introduction of cotton and rice into this State, has almost entirely done away with the cultivation of all other plants and grains as articles of commerce. In 1747, as many as 39,308 bushels of Indian corn were exported, and in 1792, as many as 99,985. The smaller grains, however, have never been cultivated with much success, and those mills which have been erected for making flour, have almost all of them, fallen through, for a want of a proper supply of the raw material.

Though, the raising of silk has never been much attended to, in this State, the day is not far distant, when it will occupy a place, second only to cotton. In all the attempts that have been ever made in Carolina, to rear the mulberry and the silk-worm, the most triumphant success has been promised. The native silk of this country is surpassed in richness of color, in strength and durability, by that of no other in the world. The highest amount which seems to have been ever exported was 3,416 lbs. in the year 1755.

WINE has been also made with success in Carolina; and it may be safely said that our State abounds in a variety of climate and soil that will successfully produce all the vegetables and plants that have been cultivated with profit in Europe or elsewhere.

Thus, have I briefly traced the history of our agriculture, from its first rude beginning, up to its present state of improvement. It has passed through many transitions; but in all of them, we have discovered on the part of the planter, a slow, though, steady disposition to improve. We have beheld five or six generations of our fathers go before us, in their toilsome, though honorable profession. Laboring with one hand, and with arms in the other to protect them from savage invasion, they present themselves performing their laborious task of clearing the forest. We have watched them under their various defeats and successes. We have seen them half clothed, and with scanty food, languishing under the various and sudden changes of an inhospitable climate. With hopes as lively as their own, we have beheld, how they put the first seed of their industry into the soil, and how, when they expected a rich harvest, they reaped nothing but weeds. Perhaps under such disappointments we would have given up all as lost—perhaps, we would have desponded. *They* did not! Gaining ex-

perience from their misfortunes, they persevered still; and they succeeded. Others followed them, and were taught their example. How encouraging has been the result! A handful of adventurers, who landed on our shore in 1670—poor and destitute—in the next ten years had increased to almost 6,000 hardy and independent planters. Nineteen years after that, they could number a population of 14,000 whites and 18,000 blacks—the former of whom, had now grown, sufficiently powerful, to throw off, the oppressive government of their overtaxing proprietors. In the next half century, they had peopled the state with a population of almost 200,000 souls, spread all over the country, adding to it such strength, and riches, and influence, as to enable her people to declare themselves independent of every other government in the world. Such was Carolina then! What is she now? A bright star of a still brighter constellation; shedding together the ray of their combined light; animating industry wherever found; and enlivening the eye of liberty wherever reached. If I am asked, the cause of this high success—these triumphant achievements, I answer, it is to be found, in the attention, which we, and our ancestors have paid to agriculture; and to the independent and manly spirit, which that profession always engenders.

Cultivation of Wheat in Marlborough District.

Mr. Editor,—If the following thoughts upon the cultivation of wheat, can be turned to any account, in your useful journal, I will be gratified at having contributed something to so praiseworthy an undertaking.

That wheat, as a crop, in this State, can be made to yield a large and immediate profit, I doubt, except under peculiar circumstances; yet I believe, the ultimate profit from cultivating it, would be very considerable. Our lands in many places, are literally worn out under the cotton and corn system. If we would adopt a systematic rotation of four or six years, I, have no doubt, that, our lands would in the course of a few years, yield much larger profits. I would suggest the following rotation.

Cotton—Corn—Oats. To be ploughed in just before ripe, and cow-peas sown down at the same time; the

latter to be turned under just before frost—wheat to be sowed within four or five weeks after; by this course, the wheat crop will probably be doubled, and the succeeding crops, will feel the effects of the manure, until the rotation, will give another dressing of oats and peas. It is objected against the wheat crop, that, it is liable to many disasters in this climate. I, do not believe that it is liable to more here, than in northern latitudes; in looking over the agricultural papers of the Northern States, as well as those of Great-Britain, we find frequent notice of the diseases of wheat; and it has at least one enemy north of us, that has never attacked it here; I allude to the Hessian fly. The lands at the North, yield more than ours from several causes; of which climate may be one: for, I believe the longer the crop is, in coming to maturity, the heavier the product, all things else being equal; but one chief cause of the greater prodvctiveness of their lands, is probably, their better system of agriculture. With them, wheat is an important crop, and of course, they bestow much care in preparing the land, and putting in the seed, &c. With us, it may hardly be called a secondary crop—we generally plant it when it will interfere least with the gathering of cotton, and we hurry through the work like a man working by the job; and then if we fail, in making a good crop, we lay all the blame at the door of providence. In making this reflection upon my brother planters, I do not hold myself up as an exception; for, I cannot thank my God, "that I am not as other men are," in this respect. I knew a planter once, who was as uniformly successful in raising wheat, as any other crop; and I believe the whole secret with him, consisted in carrying out in that as well as all his other business, the rule "that whatever is worth doing at all, is worth doing well." He selected his seed from the best wheat, and such as was perfectly ripe, before it was harvested; (for the general harvesting commenced as soon as the wheat was "out of the milk.") He always planted his seed, when the proper season arrived, without regard to the wants of the cotton-field. He would never sow immediately after a heavy rain, even in light land, for he said, *experience* had taught him that the crop would not succeed well, when sowed at such a time; his wheat crop generally followed Indian corn, the stalks of which were carefully gathered, and

taken off the ground before the wheat was sowed; he ploughed in his seed from 2 to 3 inches deep—then made the ground as smooth and level as a garden, by running an iron tooth, or bush harrow over it, once or oftener, he carried the corn-roots into the water-furrows, and if any clods or unevenness remained, they were broken or smoothed with hoes. By taking these pains, the seed were covered of uniform depth or nearly so, in consequence of which the grains sprouted, grew, and where the soil was the same, ripened together, every stalk being equally, affected by the vicissitudes of weather.

The proper season for sowing depends upon the kind of wheat. The Early Spring, or little White May wheat, (the kind with which I am most acquainted,) should be sowed from the 15th November to 1st December; if sowed earlier, it is liable to be cut off by late spring frosts; and if later, it is liable to be attacked by the rust, before it ripens. The later kinds, are sowed in this part of the State, from 1st September to November. I made this year, what would be considered a pretty good average crop of late wheat, sowed the 1st week in November. As this was an *experiment* crop, *(I like experiments in farming,)*—I will give you some of the particulars. The land, (part of a worn out old field,) had been in pasture the year before last; in June of last year four acres were sowed down in cow-peas, a bushel per acre; four acres in cotton seed; five bushels per acre broad-cast; both pieces were turned over with double horse-ploughs about the middle of September. The growth of peas was very luxuriant; the cotton did not attain more than eight or ten inches in height, and of course, but a thin covering to the ground; the piece on which the peas had grown, yielded by *estimation*, fifteen bushels of wheat per acre—the other, about seven and a half; adjoining the latter piece was half an acre that had no previous preparation, the product of which, was not more than one bushel. The quantity of seed used was half a bushel per acre. I sow from three pecks, to one and a half bushels per acre of the Little May Wheat; being governed by the quality of the soil, and time of sowing, early sowing and light land, requiring the less seed. My crops seldom reach to fifteen bushels to the acre, and my neighbors, so far as I have information, have no better success.

My miller has informed me, that the Little May Wheat has a thinner bran than any other that he has ground; and therefore yields more flour. With the mill in good order, and an experienced miller, I generally get a barrel of 196 pounds, to every five bushels, but about every seventh barrel is of inferior quality. But to make this much, the wheat must be *perfectly* clean.

A few years ago, the smut-ball appeared in my wheat, and for two years, the crop was not worth grinding.—For the nature of this disease, and remedy for it, I refer you to the volume for 1833, of the Penny Magazine; by using the remedy there suggested of steeping the seed in brine, and rolling in lime, I have got rid of the disease.

If I had not already spun this article out to a most *unreadable* length, I might offer some further remarks upon the great increase of cattle provender, and of consequence, manure, that could be produced on a plantation, where wheat was one of the market crops, and also on the advantage of substituting it in part, for cotton, on some of the large plantations, that the spirit of emigration has transferred into the hands of small planters.

P. D.

Remarks by the Editor.

We commend the suggestions of our correspondent, P. D., to the consideration of the planters of the Southern country generally. They are the result of many years observation and practice as we happen to know, we should be happy to hear of their being extensively acted upon by our planters. If wheat be grown only as a secondary crop—the aggregate quantity will go very far towards supplying our own markets. Our correspondent, is himself extensively engaged in the culture of cotton, and considers any other cropping of minor importance, yet it has been his practice for a number of years to plant wheat as a market crop. The quantity, it is true, has been small, and wholly consumed by his neighbors and the good citizens of an adjacent town, where his flour is considered equal to any in the world, and readily commands the very highest price. We are pleased to learn, P. D., "likes experiments in farming," and take this means of informing him, we are not less fond of recording them. Does he take?

Fibrous Leaved Plants and Foliaceous Fibres.

Mr. Editor,—As some of your readers may be unacquainted with even the elementary divisions of plants under the modern natural system of botany, and as this simple preparatory knowledge will facilitate their understanding my communications on the topics of fibrous leaved plants, and of their *foliaceous fibres*, I commence with a brief statement of the leading facts.

1st. All flowering plants are arranged under two great divisions, the first called Monocotyledons, and the second called Dicotyledons—because in the first division, the plants have their *seeds* in a single mass; as the indivisible kernel of corn, or of oats; and in the second division the plants have their seeds in a double mass, as the divisible kernel of peas or of beans. The seeds of the monocotyledons generally grow into stems, commonly called *stalks*, e. g. a grain of corn into a corn-stalk; and the seeds of the dicotyledons, into stems, mostly called *trunks*, e. g. an acorn into a trunk of an oak tree. By sawing across a stalk of corn, and a trunk of an oak, it is observed that the stalk is softest in the centre, and hardest in the circumference, and that on the contrary, the trunk is hardest at the heart or centre, and softest at the circumference. As the *stalks* or stems of the monocotyledons are said to be increased by additions *interiorly*, they are also called endogenous plants. As the *trunks* or stems of dicotyledons are said to be increased by additions *exteriorly*, they are also called *exogenous* plants. Among the endogenous plants then, the stalks grow from the centre towards the circumference; and among the exogenous plants, the trunks grow from the circumference towards the centre. But the sawed section of the trunk of an oak, exhibits a series of concentric circles in the wood by which its age may be known; yet the sawed section of a stalk of corn, does not exhibit concentric circles, and hence its age cannot thus be told. These differences are accompanied by a still more striking circumstance, viz. the presence of a proper bark, on all exogenous trunks, and the absence of a proper bark on all endogenous stalks. Hence then the monocotyledons seeds produce *endogenous* stems, *without bark*, and the dicotyledons seeds produce *exogenous* stems, *with bark*. But there is also a great difference

between these great divisions of plants in the characters of their leaves. The endogenous plants with *barkless* stems have leaves with *parallel veins.* The exogenous plants with bark-covered stems, have *leaves with branching net-like veins.* Hence, whenever we see a monocotyledons seed, we can predict that it will produce an endogenous stalk or stem, *without bark*, but with *leaves of parallel veins*, e. g. the leaves of the lilly or of Indian corn. Hence also we can predict that a dicotyledonous seed will produce an exogenous trunk or stem *with bark*, and with leaves of reticulated veins, e. g. the oak, the bean. The bark of enogenous stems, as well as their leaves has a reticulated structure. The fibres obtained from barks may be embraced under the generic epithet of *cortical fibres.* But flax and hemp are obtained from the reticulated barks of their respective exogenous stems; and hence, flax and hemp are fine and *course cortical fibres.* To get out the longitudinal fibres from the net-like structure of barks, the transverse fibres must be broken, rotted, or torn. Hence the necessity for the process of rolling the barks of the flax and hemp plants to get rid more easily of the transverse fibres. The same rolling, however, which *destroys* the transverse fibres of bark must *weaken* the longitudinal fibres, and hence the endeavors to get machinery to dress the unrolled barks of flax and hemp, that is, to extract the longitudinal fibres, and leave the transverse fibres as refuse, under the name of *tow.* The substitution of other exogenous plants to furnish fibres equivalent to flax and hemp will be always attended by the same difficulties in rupturing the transverse fibres and separating them from the longitudinal fibres. The barks of the hop, of the nettle, and of hundreds of other exogenous plants, have been respectively tried as substitutes for the barks of the flax and the hemp plants of antiquity, but these have retained their places to the present day. We are now prepared to understand the nature and superiority of fibrous leaved plants and of their foliaceous fibres. They all belong to the great division of monocotyledons or endogenous plants with barkless stems, and parallel-veined leaves. The branching-veined leaves of exogenous plants, are always articulated with the stem, and fall off by disjointing. But the collateral unbranched-vein leaves of the endogenous plants scarcely ever ex-

hibit any articulations with the stem, and consequently do not fall off by the disjointing process.

Another common characteristic of the leaves of endogenous plants is that said leaves often sheath the stem at their bases, the *leaf-sheaths* being *entire*, as in the sedges, or *slit*, as in the grasses. But for the objects of this communication, the most important characters of these leaves are their *parallel veins*. But even under this character, important subjections must be observed. These parallel veins may either run in the direction of the length or of the breadth of the leaves in straight lines, or obliquely in curved lines; but the section in which we are especially interested, embraces solely the *leaves with longitudinal parallel veins in straight lines*. These characters are all exhibited both in the leaves of the lilly, and in the leaves of maize, but the leaves of the latter, have the additional character of a midrib in the centre, while the leaves of the former are entire, or without a midrib. By substituting the word fibres for the word veins, we can say that among the endogenous plants, there are many species whose leaves contain *straight longitudinal and parallel fibres*, which when separated may be and must be *called foliaceous fibres*, and which form superior substitutes for the *cortical fibres* of flax and hemp. Now admit, for argument sake, that the straight longitudinal parallel fibres or veins, are connected by smaller transverse fibres or veins, yet the fact is, that the longitudinal fibres can be extracted from the transverse ones, or the latter can be separated from the former, without the intermediate process of either drying or rotting the leaves. The longitudinal, parallel and straight fibres can be obtained from the freshly cut green leaves, by *simple scraping only*. By this simplest of all mechanical processes, executed by the most indolent and ignorant natives of the torrid zone, with the rudest possible instrument—a mere stick of hard wood, their foliaceous fibres have been extracted from time immemorial, from the green leaves of their respective plants, although the same natives have around them in great abundance, many species of exotic plants, from whose barks they can obtain superior substitutes for flax and hemp.

These foliaceous fibres have been known in commerce and by travellers, under many very different names. The coarser qualities have been called Tropical Hemp,

Manilla Hemp, Sisal Hemp, and Grass Hemp, by persons who use the English language. By the Spanish Americans and Indians, they are named Pita, Pita Ordinaria, Henequen, Sosquil, Cocuiza, &c.; and so far as I have been able to ascertain all these varieties of coarse foliaceous fibres have been obtained from the leaves of different species of Agaves. Their manufactures are called grass-rope, white-rope, &c. The finer qualities of foliaceous fibres have been respectively known under the names of tropical flax, grass flax, grass silk, vegetable silk, Pita floga, Ixtle, &c., the longest and strongest of which, I have ascertained to be extracted from the green leaves of a Bromelia—the kind called New-Zealand flax, we all know to be derived from the flax lilly, called Phormeumtenan, now acclimated in France, and become a very important accession to its agriculture and manufactures. The epithet, *vegetable silk*, has been lately applied to the fine fibres of the lamina of the stalk of the Musa Abaca, or wild Banana of the Phillipines, which the French are also propagating in Algiers. Your own indigenous Yucca filamentisa, you know, is often called bear's grass, and silk grass; and its foliaceous fibres, will hereafter likely be also called vegetable silk or Carolina flax. The majority of the fibrous leaved plants may be included under the old natural order of Linnæus called Coronaria, or *Lilliaceous plants*, which modern botanists have split up into the sub-orders of Bromeliacea, Asphidelœ, Tulipaceæ, &c. The Pandaneœ, whose species resemble gigantic Bromelias, in their *foliage*, (and hence called the Screw Pine,) and the Bull-rush tribe in their fructification, also furnish many very valuable plants for fibres and manufactures. The noble order of Palms also furnish many valuable species especially the Badris Acanthocarpos, or Ticu Palm of Brazil; the Maurilia Flexuosa, or Moreche Palm, and the Saguenis Rumphu, or Gomuly Palm of Sumatra.

In this communication, my object is to render myself intelligible to the plainest capacities, and if I am guilty of tedious tautology and tiresome repetition, my motives will plead my excuse. I conclude by an extract from my memorial to Congress, of a single article on the topic of fibrous leaved plants, which will serve as a text for my future sermons.

"19. That your memorialist most respectfully solicits the *especial* attention of Congress to his various commu-

nications on the *propagation of fibrous leaved plants*, and the *production of foliaceous fibres* in the Southern States, in which he has shown, that they are *all hardy, productive perennial plants*, which *propagate themselves* on *sandy, stony and swampy* surfaces, in the *sun* and in the *shade*, that their fibrous leaves produced in any soil and situation, with the least care and cultivation may be *cut* in any weather, and every *season* of the year; that these *freshly cut leaves*, may be *immediately* manufactured into excellent *paper*, at so cheap a price, that it will become as important an auxiliary to popular education, as the printing press itself; that these *perennial leaves*, will yield their fibrous contents in the shortest possible time, with the simplest possible preparation, as their *foliaceous fibres*, are extract-from the *green* leaves by *simple scraping only;* that immediately after this mechanical separation, these *parallel longitudinal fibres*, are ready for baling, exportation or manufacture; that these *fresh foliaceous fibres*, (so great is their individual strength, elasticity and length,) may be *instantly* wrought, *untwisted*, into very cheap forms and fabrics, for which the *unspun cortical* fibres of hemp and flax, are entirely unserviceable; that, moreover, the *foliaceous fibres* are so much *cheaper, lighter, stronger*, longer, more *elastic*, and more *durable*, than cortical fibres, that they can be *spun* into thread, twine, and cordage, and woven into cloths finer than cambric, and coarser than canvass, which will become superior substitutes for similar fabrics of flax and hemp, for the general consumption of mankind; that furthermore, many of said *fibrous leaved* plants form excellent hedges for themselves and for other objects of cultivation; that the *entire leaves* of many species, constitute the best materials for the simplest manufactures of the cheapest possible matting, bagging, and other envelopes of merchandize; for the really *domestic manufactures*, or farm, family, and female manufactures of hats, bonnets, &c., by an innocent, independent and rural population; that hence the *propagation* of *fibrous leaved plants*, will form a more distinguished epocha in the agricultural prosperity of our Southern States, than the invention of the cotton gin; *that the production of foliacious fibres*, will create still more beneficial revolutions in the manufactures and commerce of all civilized nations, than has yet been effected by the cultivation of *Capsular fibres*, called cotton; and that therefore their introduction

to the intelligent industry of our free institutions, should be effectually favored by the statesmen of our nation, and by the philanthropists of the world!"

Very respt'ly, your ob't serv't,

HENRY PERRINE.

Washington, D. C., 16th October, 1837.

On Treading Land.

Mr. Editor,—I am no book farmer, nor am I a scholar, to write grammatically, but reading some half-dozen of the Southern Agriculturists, has removed my prejudice against book-farming. I was ignorant of what they contained, and some low country theorists could make a better crop in half an hour with his pen, than I could in a whole year, with all the industry I could use; and the gentleman does make more cotton bales to the hand, than I do—but he brings his horses and mules from the west, and every article of clothing from the stores, and I will sell him no small quantity of forage for his stock, and provisions for his family. He asks me how it is possible, that I clear more to the hand, than he does, when he makes so much more cotton, than I do. The answer is, first, he plants too much cotton, and too little bread-stuff, but principally, because he treads his land too much. For the benefit, (as he calls it,) of his pastures, he must put his stock on, and consequently packs down the land all winter.

This used to be my plan, but upon experiment I found it took more flesh from my team, to get it up in the spring, than the pasturage had put on them; besides, it takes two years, to get hard trod land back to fine mold, and it will not produce well till it is fine. My plan, now, is to plant every thing in one field, for many reasons, but principally, to prevent treading. Now, I cannot pasture the land, that we tread or sow, for before the corn is ripe the cotton is open; before the cotton is out, the small grain is growing; and corn is planted before harvest, so we cannot tread the land.

My farm is small, I keep mules and horses to run eight ploughs; these are never taken from a two acre lot, only for harness or some other use. In this lot, I keep from

25 to 30 head of hogs that never go out, till they go to the smoke-house; they generally average about 230 pounds, at eighteen or twenty months old. The pasture for my cattle, is fenced to itself, and never ploughed, only as we turn what we manure back in the field; to be sure, there is a small portion of grain in the field, that is not eaten by any thing, but the land is not trod, and yields enough more than it formerly did, to keep all my stock in much better plight than formerly. By not treading, the land is improved; all the vegetable matter, that is taken off by grazing, or destroyed by the hoof, is returned to the soil, and it is manured with what grew there, without the cost of carrrying; besides, we plough our land with one horse, with as much ease, as we formerly broke it up with two and it is now clear of clods. We tend more of it, with less hard labor; besides, the great labor in splitting, hauling, and repairing cross-fences, there is another advantage to be without them. In cultivating the crop, we lose more time, in turning on both sides the cross-fence, than would tend twice the land it covers, which land would bring three hills of corn in each row, or three rows across the field. All this, and more, used to be lost by me, for the time expended in making cross-fences, (formerly,) is now employed in manuring and cultivating more land. In our broken land, that which is tread most washes most; where it is not tread, it takes in more rain, before it runs off, and the vegetable and its roots, that grows on it, protects it from washing. Notice two equal pieces of ground with a branch running through the centre; the one tread, the other not, after a heavy shower. I think it will convince any farmer, to see the oozing in from the hard tread side, muddy, and from the soft grassy side, clear. I would charge less rent for a summers cultivation on my ground, than for one months pasturage in wet weather, to be trod as was my former practice. I purchased my place ten years ago, for less than three dollars per acre; a place worn out raising tobacco, fifty years ago; those best acquainted, say it produces better now, than it did twenty years back.

PLOUGHMAN.

Wrightsboro,' Geo., Nov. 14, 1837.

A bed of Lime-Stone Rock recently discovered on Ashley River.

We cannot deny ourselves the pleasure of recording the successful exertions by our city authorities, to avail themselves of the geological resources of our own State. Within a few months, many thousands of bushels of shells, which for centuries for aught we know, have been laying uselessly blanching and undergoing decomposition about our harbor, have, under their orders, been advantageously employed in filling up low places, raising streets, and forming side-walks. This, as may be supposed, has been attended with very considerable expense, as every bushel has cost the Council from 3 to 4 cents, besides the cartage to the points requiring the shells.

We are now happy to learn from a correspondence between his Honor the Mayor, and Dr. Hume, Professor of Chemistry in the Medical College of South-Carolina, that an apparently inexhaustible body of lime stone, adapted to the permanent improvement of our streets, has been discovered within a very few miles of this city. As the subject matter of the Mayor's letter may be inferred from the reply by Dr. Hume, we publish only the latter, as affording all the information we possess on this interesting subject—except, that we have learned from another source entitled to credit, the lime stone has been offered our authorities at the low price of $2 50 per ton, deliverable at any point on the Ashley side of the city.

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November 14th, 1837.

Dear Sir,—I have received your favor of the 13th, accompanying a box, containing specimens of a Rock, from Mr. Francis' plantation on Ashley River, which you request me to examine, and report upon, relative to its capabilities of improving the streets of the city.

It gives me pleasure to inform you that I have devoted myself to the examination of its physical and chemical properties, and am prepared to furnish all the information, which has been suggested by this examination. Simple inspection exhibits the rock to be a concretion of marine shells, most commonly in fragments, but many remaining sufficiently perfect for distinct recognition. Scattered throughout the mass, are small fragments of quartz, in the form of coarse gravel, distinctly visible to the naked eye, while other fragments, still smaller, require the aid of a lens to be seen. The external form of the nodules, for such they appear to be, is various, but in general they possess the

irregular surface, which would naturally be supposed to arise from an aggregation of hemispherical bodies, such as shells usually are. The internal structure is clearly indicative of its composition. Its cohesion is valuable according to its moisture, for it is apparent that those specimens which were obtained from the bottom of the creek, are softer than those obtained on the surface of the dry land. Its hardness is less than marble, but greater than chalk. It is easily broken into fragments about the size of the component shells, but it is not easily reduced to an impalpable powder. When submersed in water, it does not fall to powder, as the marls commonly do, nor does it become firable by excessive dryness. Chemical examination proves it to be of testaceous origin, for it yields on analysis, 80 parts of carbonate of lime, 20 of silex, (which is mechanically mixed) and a trace of iron and animal matter.

In answer to your several questions, I beg leave to reply, that I do not consider it to be sufficiently hard and firm, to resist the action of the wheels of heavily laden vehicles, nor even of lighter ones, when moving rapidly. It will certainly not be durable, if used as paving stones, for the percussion of the wheels will soon reduce it to fragments. I am induced to think that it could be advantageously used as a foundation for a road. If defended from the repeated blows and attrition of the wheels, there cannot be a doubt about its fitness and durability for improving the streets. It is certainly able to support the actual weight of the wheels, but it is too brittle to resist the percussion of the wheels.

The plan which appears to me to be most proper, is to make a substratum of this limestone, thus securing a solid and unyielding foundation, over which may be placed smaller fragments of the same, or broken stones of greater hardness or even shells, taking care in the arrangement of the strata that the wheels are not permitted to strike directly upon the Ashley River Lime-stone. If the surface of the road is level and smooth, percussion cannot take place, and of course comminution of the stone cannot occur, and the road will not be impaired. The principles of McAdam can be fully carried out with this stone, and it will prove beneficial, and the road will be durable, provided care is taken to repair commencing irregularities, and removing displaced stones which occasion jolts, and consequently pound the surface in spots and produce the above mentioned irregularities.

I should suppose this material to be valuable for filling up holes, occasioned by mud puddles, it would consolidate and form a smooth surface, which would not be again dug out in wet weather, by the passing wheels.

In the emergencies of the city for materials for improving the streets, I cannot but think that this stone will prove highly valuable, and be an acquisition to the city. In conclusion, I do think it advi-

sable to bring to the notice of Council the probably advantageous employment of this material for improving the streets, and to recommend that experiments be instituted to test its qualifications in a practical manner.

I do not maintain that this stone is exactly, nor admirably adapted to the purpose in question, but in the absence of better, it is deserving of notice. Lime-stones, in other countries, are not selected for road-making, because other and harder material can be obtained; but I remember upon the Salisbury plains, in England, I travelled upon an excellent road made of chalk! Similar roads I saw near Dover, and in France.

The stone in question is harder than chalk, possesses the same chemical composition, and is endowed with the property of consolidating by pressure and cementing by the percolation of water through its interstices.

In the absence of other and acknowledged better materials, it is proper to experiment upon this, and I sincerely hope and confidently trust that success will attend your endeavors. If my suggestions are of any value to you, it will afford me pleasure, and if I can be of any assistance to you in furtherance of your laudable desire to improve the city, you are at liberty to commond my services. In the mean time, I have the honor to be,

Very respectfully, yours,

WM. HUME.

The Honorable HENRY L. PINCKNEY,
Mayor of Charleston.

PART II.

SELECTIONS.

Effects of Agricultural Bounties.

[FROM THE FARMER AND GARDENER.]

It has been stated in several of the papers published in the State of *Maine*, upon an estimate made by an agricultural gentleman, that the product of *wheat* in that State this year, will be about 1,600,000 bushels equal to 320,000 bbls. of flour. Last year it is stated, on the same authority, that Maine imported 150,000 bbls. of flour, and that she will this year have a considerable quantity to export. This favorable change in the product of this article has been brought about thus suddenly by the adoption, by a late Legislature of that State, of a law granting bounties to the raisers of wheat. Such has been the avidity with which the farmers have availed themselves of the provisions of the law, that it is calculated the amount of bounties which will be drawn the present year from the State Treasury, will not be less than $150,000. This, at the first view, will appear a very large sum; but when the immense benefits which will probably accrue to Maine are properly considered, they will be found to outweigh every objection that could be raised on the score of the abstraction of so much money from the coffers of the State. Heretofore, Maine has had to rely upon other States for a large portion of the breadstuffs consumed by her people; but now, under the influence of a wise and a salutary enactment, in a single year, she presents to her sisters of the confederacy, the singular and most creditable example of becoming a rival exporter. This state of things, while it is gratifying to that generous pride of State, which each of her sons will doubtless feel, will tend to increase individual and public wealth. It has long been the policy of the eastern States, generally, to stimulate agricultural industry by similar inducements, and the good effects are visible in every direction throughout that region of frugality and industry. With soils and climates by no means favorable to the full developement of vegetable growth, the condition of their agriculture is very far in advance of that of most of the other States. By judicious management of the resources within their possession—by strict observance to the making and preservation of manures by the creation and support of agricultural societies—by the indefatigable exercise of a hardy industry on the part of the people, and by the fostering and paternal care of the Government, all those difficulties arising from lands measurably sterile, a sun inauspicious, and seasons of short duration, had been overcome. With these examples—with the rich fruits of their happy

effects—before them, should not the legislatures of other States, where Providence has been so much kinder, take counsel and folllow in the footsteps of their eastern brethren; and above all, should not the *people* bestir themselves in the good work of reformation. It is useless for the husbandmen of our country to call upon legislative bodies for aid without first setting example to show that they are worthy of it. If we were asked, what are the incident steps to be taken by the people? We answer, first, that agricultural associations should be formed in every county, whose population will support one, and in addition to these, *general State* societies should be also formed, and when sufficient impetus shall have been given to those preliminary measures, —when a spirit of enterprise is diffused throughout the several States, *annual fairs* should be held. As soon as the county associations are organized and in active operation, then the several State legislatures should be called upon to grant pecuniary aid to create and sustain pattern farms. All new enterprises in agriculture should also receive the fostering protection of the State Government. What would the burthen of the expenditure of a few thousand dollars, by each State, to promote objects of real agricultural utility, be compared with the sum of blessings which would flow from such outlays? Money judiciously placed for the advancement of such objects, would be prolific of good to entire communities; for there is nothing more true than this—that all such public appropriations of the means of a State, in their good effects and benefits, encompass every class of society; for though they may be, in the first instance, bounties bestowed to the tillers of the earth, ultimately every portion of the community reap in common with them the advantages flowing from them.

Several years since, some of the Eastern States granted bounties to the culture of silk, and the consequence has been, that the wisdom of those measures are to be seen in the rapid advance which it has made there, it being admitted on all hands that in the New England States, it is very far ahead of the rest of the country, and this too notwithstanding these States are by no means as well adapted by *location*, as any of the middle or Southern States for that culture. Should not these facts awaken a spirit of inquiry in the minds of the entire farming communities of the rest of the country? Should it not inspire them with feelings of emulation, and the desire to husband and protect their interests? If we are asked how this is to be brought about, we reply that were it desirable to obtain the patronage of the Legislature, those who are clothed with representative trusts must be made to feel certain, that what is asked will be popular with the people. If this fact be conceded, and we think it cannot be denied, then we say, that every man engaged in the cultivation of the earth must move in the premises. Let meetings be not only called, but *attended*—let the rich and the poor go to them—for all are deeply interested in their results—and prove by the display of *numerical* strength, that *numbers* are ready to back the prayers which may be made. In this as in all other popular governments, it is absolutely necessary to demonstrate, that what is asked for, is so asked by *majorities;* for after all the representative should have his *warrant* for his action. Give him that, and you will find but few possessing hardihood enough to resist calls which come thus supported before them.

It is not sufficient that, in many of our legislative bodies, *committees* are annually appointed "*on Agriculture*"—if these committees be not formally approached by the people, they will do nothing, and for the very good and sufficient reason, that *nothing* is asked of them. If

you require them to do some substantive good, you must appear before them in a shape and form that they will both understand and appreciate. The difficulties under which agriculture rests must be stated and remedies pointed out. When these things are properly done, we may expect to see such legislative action as every friend of the cause will rejoice at. But till then, it is futile to hope, that legislative bodies will move in behalf of the agriculture of the country. Agriculture is the best interest of every country, but if it expects to be respected according to its merits, it must shew its lands—its members one and all must move in solid columns, and put their shoulders to the wheels, and then if they call on Hercules, he will most assuredly help them.

Facts versus Theory—a comparative view of nutritive matter, in Potatoes, Corn, Wheat, Rye, Barley, Oats, and Turnips.

[FROM THE GENNESSEE FARMER.]

I like science, and wish there was a great deal more of the commodity current in our country, for science where perfect is truth itself, and amounts in all cases to demonstration. I like to see a spirit of inquiry into cause and effect extending among farmers; a desire to ascertain the why and wherefore of the operations they are daily performing; and I respect the men of skill, experience, and talent, in this and other countries, whose labors have been instrumental in bringing about this state of things. But science has not yet got at the bottom of all things, and her deductions are sometimes directly at variance with established facts. Such things do not prove that science is worthless, but that philosophers are fallible.

One of the striking instances of this discrepancy between theory and fact, is found in the relative value affixed to our most common nutritive substances by the chemical analysis of Sir H. Davy, and adopted by most writers on agricultural chemistry since that time, but which is evidently without foundation in reality. Davy's estimate of the nutritive matter and consequent value, contained in 1000 parts of the different articles used for nourishment is as follows;—

Winter wheat, - -	955	Rye, - - - -	792
Spring wheat - -	940	Barley meal, - -	920
Indian corn - -	800	Oat meal, - - -	670
Potatoes - - -	250	Turnips, - - -	42

Now take this table and make a calculation on the nutritive matter furnished by an ordinary crop of each article from one acre of land, and each acre would give in nutritive matter as follows:—

Potatoes, - - - -	3125 lbs.
Indian corn, - - - -	1920
Winter wheat, - - -	1146
Rye, - - - - -	712
Barley, - - - - -	943
Oats, - - - - -	555
Turnips, - - - -	315

Thus, according to theory, one acre of potatoes is equal to about two acres of corn, three of wheat, four of rye or barley, or ten of turnips! That such is the fact, no one who has paid any attention to the matter, can believe for a moment. Chemists designate those parts of a substance which are readily soluble as nutritive, and reject the remainder;

and as farinaceous substances are of this class, it is no wonder that potatoes are ranked so high when compared with some other substances. Experience prove however, that there are some principles in the nature of nutrition overlooked: some steps in the progress of digestion and assimilation, that science has not yet fully investigated or understood.

Chaptal says,—"It is not by an analysis of plants, nor by the proportion of their constituent principles which can be extracted by water, that we can judge of the nutritive quality of vegetables, or other alimentary substances. I have already proved that a nutritive substance, deprived of all its soluble parts by water, is capable, in the progress of its decomposition, of forming new and soluble compounds. It is only by experiments and by the effects of this or that kind of food upon animals, that we ascertain the differences exisring between various nutritive bodies."

This is sound doctrine: it is by experiment alone that such matters can be thoroughly tested; for the stomach and its juices employed in digestion, are so different from the chemist's laboratory, that to infer the same result from the action of each, is very absurd.

According to the above table an acre of potatoes will produce 3125 lbs. of nutritive matter, while an acre of turnips gives only 315 lbs. or in other words an acre of potatoes is worth rather more than ten times as much as an acre of turnips for feeding. This is the theory, but what says the experience of the farmer? Judge Powell, the President of the Pennsylvania Ag. Society, says, "I have thought that the soil was rather improved than impoverished by a crop of turnips. I have found them to make excellent beef and mutton. I cultivate a stiff calcareous loam; and in such a soil long experience teaches me that the turnip is the only root crop worth attention. *I have ceased to raise potatoes for live stock.* I think good farming, where a certain market is not contiguous, requires the potatoe crop to go but little beyond table use."

In the *Farmer and Mechanic*, is a communication from Mr. R. Gordon stating the result of an experiment in fattening cattle on Ruta Baga. Two yoke of oxen were selected. To the one yoke he allowed two bushels of ruta baga in the same time that the other yoke consumed a bushel of corn; and the result of the experiment satisfied him that two bushels of ruta baga is better than half that quantity of corn for working oxen, or rather neat stock. The turnips used by Mr. Gordon were from a crop of 1510 bushels to the acre, a most extraordinary yield.

No man who has tried the turnip can doubt its nutritive qualities, when applied to the purpose of fattening cattle. Experiments here have been to the full as satisfactory as in that land of turnips and fat cattle—England. Since I commenced the culture of the root some five years since, and then gave it a fair trial, I have used nothing else for fattening beef, and never while using potatoes or corn did my cattle take on fat better, or make beef of a finer quality. It certainly exceeds all other feed in cheapness. My turnips cost me from four to six dollars a hundred bushels, and two bushels a day, is an ample supply in most cases, for an animal. Compare this cost with potatoes, corn, or other grain, and the value of the turnip *will* be fully manifest.

Cultivation of Grasses.

[FROM THE PRACTICAL FARMER.]

In the modern and improved system of husbandry, the cultivation of a farm may be considered under two heads; the *grass* and the *arable* land.

The convertible system of husbandry, where land is converted from tillage to grass, and then again from grass to tillage, and so on, alternately. The advantages to be derived from this practice says a writer of authority, (Sinclair,) cannot be too much dwelt on. By the grain crops a sufficient quantity of straw is provided, partly to be used as food, but principally to be employed as litter for cattle, while at the same time, a fair profit is to be derived from the grain. By the grass and green crops, a number of domesticated animals are maintained both in summer and winter; and when they are abundantly littered, as well as fed, a regular and sufficient supply of valuable manure is secured. Hence it is that alternate crops for the food of man, and of the inferior animals, is in general, indispensable for the profitable production of both corn, and of animal food, on all soils susceptible of cultivation.

On the subject of cultivating the grasses, we shall take for our guide, an authority we have before acknowledged.

Judge Buel has given a classification of the grasses, the seeds of which can be procured in this country, and pointed out the soils on which they respectively thrive. He divides them as follows:

1. Grasses best suited to arable lands, and designed to alternate with grain and roots.
2. Those best adapted for hay or meadows; and
3. Grasses which are most profitably sown for perennial pastures.

1. There are several descriptions of land, which are much more profitably employed in tillage than in grass, particularly those that are dry or light, and which have little tendency to produce good herbage. Yet constant cropping with grain would soon exhaust them of fertility, without an expense for manure which few can afford. The system of introducing artificial or sown grasses, after two, three, or four years tillage, is happily calculated to avert the evil, and constitute the basis of most of the late improvements in arable husbandry, as well as farm stock.

The grasses best calculated for this purpose, are red and white clover, lucern, sanfoin and the orchard, tall oat, timothy, and rye grasses.

Clover is the primary dependence on all soils which will grow it, and particularly where gypsum can exercise its powers. As vegetables are said to exhaust the soil in proportion to the smallness of their leaves, clovers are entitled to the high commendation they have obtained among American farmers. But as these plants are liable to premature destruction by the frosts of winter, it is prudent and wise to intermix with them seeds, of some other grass more to be depended on.

On *sands*, *light loams*, and *gravels*, (and these constitute the soils usually employed in convertible husbandry,) the orchard grass, or tall meadow oat grass, appears best calculated for this purpose. They grow early, delight in a clover soil, and are fit for the scythe when clover is in bloom, the period at which it ought to be made into hay. The

hay from this mixture, may be made before the harvest commences; and if the soil is good a second crop may be cut almost equal to the first. If intended for pasture the second or third year, either of these grasses will afford more abundant herbage than timothy. Lucern may be sown on deep sand loams; and sanfoin on dry soils, naturally calcareous, or on those which have been rendered so by marl or lime.

On *clays*, and *heavy loams*, timothy may be sown alone, or those grasses named in the preceding paragraph, separate or mixed.

On *wet soils*, and reclaimed swamps, as the only object of tillage *ought to be* to prepare the ground to be laid down in grass, the kinds indicated in the preceding remarks are suitable for such soils, and intended for meadow grasses, should be selected; yet so scanty are our assortment that we can only name timothy and herd's grass.

2. MEADOWS.—These may be classed under three heads, viz: low or alluvial lands, on the banks of rivers, creeks, and brooks; uplands, naturally moist, or of clay, or heavy loam; and reclaimed bogs and swamps. These soils, to adopt a common term, are *nutural to grasses*, while expense of tillage, and the uncertainty of a crop, render it most proper to appropriate them to grass. The objects in stocking meadows, are, to select those grasses which *yield the greatest burthen of hay*, and *afford the most nutriment for cattle.*

When mixed seeds are employed, care should be taken to select those which can be most profitably cut at the same time, the impropriety of mixing timothy and orchard grass, for instance, will be apparent, from observing that the last should be cut in the latter end of June, while the former continues to improve till the last of July.

Timothy is undoubtedly the best grass which can be employed for meadows on moist or tenacious soils. Herd's grass and rough stalked meadow grass, often come in spontaneously. And if the timothy is left standing until it is ripe, seeds enough fall to supply new plants.

For *light loams*, *sands*, and *gravels*, the tall oat and orchard grasses are probably the best, and to these may be added, red and white clover.

The great difficulty is, to prevent the deterioration of meadows. This takes place from the better grasses running out, and giving place to coarser kinds, to moss, and to useless and noxious plants; aided often by a neglect to keep them well drained. The finer and most nutritious kinds thrive well in *moist*, though but few will live in *wet* soils. It is therefore of the first importance, to keep the surface soil free from standing water, by good and sufficient drains; and it often becomes necessary to lay the land in narrow ridges, at right angles with the ditches. Another precaution to be observed is, not to depasture them with heavy cattle when the ground is wet and poachy.

Harrowing in the Fall, has been found beneficial to meadows. In Europe, top dressings of lime, marl, compost, ashes, and yard manure, are repeated at intervals of two or three years. With us, the annual application of a bushel of plaster of Paris, is found beneficial on most lands not absolutely wet. Stable manure should be applied only when it can be spared from the more profitable uses of tillage, and is far more beneficial mixed with the soil, than spread upon its surface. Its most economical application is in the form of compost, made by mixing it with bog earth, river sand, the wash from the high ways, or other rich earth, at the rate of one load of dung to five or six of earth. If turned and mixed well, this constitutes a valuable top-dressing for grass grounds, and is best applied in the Autumn. When these means fail to insure

a good crop of hay, it is time to resort to the plough, a course of crops, and re-seeding.

3. Pastures.—Here the object is to obtain those grasses that are nutritious, relished by cattle, and which supply green food from March to December, or such a mixture as will give a succession of fresh herbage during the grazing season.

The tall oat, rye and orchard grasses are best adapted to the lighter and drier soils, where the spontaneous growth of clovers and other indigenous grasses, should be encouraged by top dressings, or the application of plaster. In moist and stiff grounds, timothy and herd's grass may be sown with the tall oat.

The observations under the preceding head, in regard to draining, top dressing, sowing seed, and harrowing, lose none of their force when applied to pasture grounds. It is believed that if once introduced upon our farms, the valuable grasses which we want, would propagate themselves.

The number of grasses is very great. It is said that 215 properly so called, are capable of being cultivated in Great Britain.

In our country, the most esteemed grasses are, white and red clover, timothy, or herd's grass, the red top, and foul meadow. With these some other indigenous grasses intermix, the merits of which deserve to be investigated. Our best grasses for meadows, are unquestionably the timothy, the red top, and the foul meadow. The merits of this last are not generally known. There can be no better hay than that which is made from it. On a rich, moist soil, it will grow uncommonly dense, and I should think, would yield as much from an acre, as any other of the best cultivated grasses.

Breaking up Grass Lands.

The Code of Agriculture has some general remarks on this subject, which we insert as the experience of the best agriculturists.

If the land be wet, it is advisable to drain it completely, previous to its being broken up.

Land that has been long in pasture, does not require dung during the first course of crops that is taken after being broken up, but the application of calcareous manure is always in such cases expedient. Sometimes lime is spread on the ground before it is ploughed; at other times, marl and chalk have been used for the same purpose, with great advantage. The land thence derives additional strength and vigor, the succeeding crops are much improved; the soil is commonly so softened in its texture, that it may be ploughed with half the strength that would otherwise be necessary, and whenever it is restored to grass, the herbage is abundant.

Wherever the soil is not too shallow, nor of a friable nature, or when the turf cannot soon be rolled, if land is to be broken up from old pasture, paring and burning is the proper system to be adopted. In this way good tilth is speedily procured; the damage that might otherwise be sustained by the grub, the wire-worm and other insects, is prevented, while the soil receives a stimulus, which ensures an abundant crop.

When paring and burning, from any circumstances, cannot take place, the land may be trenched, or double-ploughed. This is effected by means of two ploughs, following each other, the first plough

takes off a thin surface of about three inches, and the second going deeper in the same place, covering the surface sod with fine mold; both furrows not exceeding the thickness of the vegetable mold, or other good soil.

If the land is ploughed with one furrow, the operation ought to be performed before winter, that it may receive the benefit of the succeeding frosts, by which the success of the future operations will not only be promoted, but most of the insects lodged in the soil will be destroyed.

When one furrow alone is taken, the best size is four inches and a half deep, by eight or nine wide. The strain on horses, in ploughing clay land, is mostly from the depth.

The rotation of crops to be adopted, when grass lands are broken up, must partly depend upon the soil, and partly on the manner in which it is prepared for cultivation. As a general principle, however, it may be laid down, that unless by the course of cropping to be pursued, the bad grasses and other plants indigenous in the soil, are extirpated, they will, when the land is again laid down to grass, increase and prevail with more rapidity and effect, than the seeds chosen by the farmer; and the consequence must be, a heavy disappointment in the future crops of grass, perhaps solely, or at least principally attributable, to a previously defective management.—*Sir R. Sinclair.*

Imported Seeds.

[FROM THE FARMER AND GARDENER.]

Sir,—My friend near Edingburgh has supported my seed project with great zeal and judgment, I have received from him some of Hickling's prolific Wheat, Chevalier Barley and Perrennial Rye Grass, of the crop of 1836.

He writes under date of June 3d, "All these are of crop 1836, and fresh thrashed from the straw, and, except a little mouse dirt, which will do no ill, are clear of weeds. Indeed, I am satisfied that the grain is sound and is to vegetate well. In consequence of the lateness of the harvest season here, it is extremely difficult to procure grain in a state of sufficient dryness for the voyage to you. What I have sent on this occasion, will afford your friends an opportunity of making an experiment on sound seed, of one year's age, if it answers, and more is wanted; this will prove the surest way to prevent the grain becoming injured from heating on the passage; still the order should be sent early, that the proper selections may be advantageously made. I found considerable difficulty in getting this kind of wheat. Permit me to say, I am desirous to be informed of the result, whatever may be the success, &c."

Of this small importation, I have set apart for you one bushel of each kind of the seed, as stated in the annexed bill: the expenses on the transaction, including the exchange, is 91.40 per cent., although the United States charges no import duty. In fixing the price, I have doubled the prime cost, which leaves 8.60 per cent. to cover trouble and the expenses that will attend it here.

The Wheat will reach you in season for this year's sowing. The Barley is two rowed, and for Spring sowing, it should be put on clean mellow land; this kind of barley is richer and of more value than the four-rowed, whether it is used for malting or pot barley. The Perrennial Rye Grass should be sown where it is to remain a number of

years; but please to observe it is the common practice in Britain to sow it along with clover; it is there as horse feed, what Timothy is with us. It is with you, by careful and patient experiment, to ascertain its value to the American farmer and grazier; as a pasture it cannot but be useful; domestic animals, like ourselves, are fond of variety, and they are benefited by change of food. This grass will prove important to our pasture, on account of its early spring and late fall vegetation, and having the property of maintaining itself in the ground for many years. Some of this grass you may with propriety sow as soon as you receive it amongst the clover sown in 1837; and the remainder should be sown along with the clover and timothy in 1838. It is desirable to learn what season will suit best for putting it in the ground. I will here take the liberty of submitting to your consideration a practice that may be said is universal in the northern part of Britain in the sowing of wheat: there it was resorted to as a means to prevent the smut in wheat, and it has perfectly answered that purpose. All Seed Wheet is treated after one or other of the following modes:

A brine is prepared by putting common salt into water until the brine has strength sufficient to float an egg. The wheat by some farmers is put into this pickle, and the light grains are skimmed off and thrown aside; other farmers put it on the barn floor, and sprinkle the brine over it with a bunch of straw or a broom, turning the wheat backward and forward until every grain of the wheat is wetted; this is the most expeditious way, but it is considered somewhat slovenly; the grain is then dried by sifting slacked lime over it, and turning over the mass; it is then sown in the usual way. There is always an anxiety to have all that has been 'pickled' sown on the same day; another process is to employ chamber ley in place of the salt pickle, and the manner of using it is the same as that of the salt brine. I presume that this last material will be most efficacious when it has age sufficient to form volatile alkali. Permit me to recommend the process to your attention. I advise making the experiment; be assured it can do no ill.

In cases where the sowing of wheat has been delayed until late in the season, whether from some necessity, or for the purpose of escaping the depredations of the fly, a portion or all the manure should be spread over the surface of the land after the wheat has been sown: this portion of the manure becomes the nurser and protector of the young plants, whose roots are at that time very tender, and so short that they are acted on by the frost before they have had time to reach the ploughed in manure; and consequently this ploughed in manure is of no service to them, and they perish from hunger and cold. I am not certain that it is now your wish to get this seed, and for that reason request you to favor me with your instructions by the return mail, if possible, so that I may have an opportunity of otherwise disposing of it this season. I have to request of you to remit the amount.

I think you will be pleased with the superior quality of the Barley and Rye Grass. The Wheat is excellent as respects size and form, but its skin is not fine; it bears evident marks of having grown in a wet season. I solicit for the experiment your careful attention; the result may not prove successful under some circumstances, while in other cases it may do well, at all events, it merits a careful trial.

Very respectfully, I am your most obedient,

JAMES RONALDSON.

Philadelphia, No. 200 *Ninth-street,* 12*th August,* 1837.

Madder.

[FROM THE GENESEE FARMER.]

Madder, as a coloring matter, has become indispensable to our manufactures, and two or three millions of dollars are annually sent abroad for its purchase, when we might easily, and it seems from some experiments in its culture, profitably produce the whole quantity required among ourselves.

Madder, or *Rubia tinctorium*, is one of a large family of plants, and for its valuable qualities in coloring has become an important article of cultivation in several countries, particularly Holland, where the province of Friesland is almost wholly devoted to its production. In Radcliff's Flemish Husbandry, the following condensed rules are given for its culture: The soil a rich sandy loam of from two to three feet in depth, as the roots must have room to penetrate;—the land laid up in ridges in autumn if to be planted in the spring, and kept clean from all weeds;—plant in April, on ridges if the ground is wet, if not, on a level, in rows 18 inches apart, and the plants 12 inches distant in the rows;—as much root as practicable should be taken with the slips to be planted, and from six to eight bushels will be required for an acre, though this of course must depend mainly on the distance adopted by the planter;—plant nothing in the intervals, but as the top shoots up bend them occasionally to the ground and partially cover with earth; when the tops fall off in autumn, earth the rows as a protection against frost, and in the spring hoe the intervals thoroughly;—the slips of the second year are the best to plant, and should be taken off in the spring when about an inch above the surface;—three years are required for the roots to arrive at perfection, when they are dug by deep trenching, the roots quickly and carefully dried to prevent discoloration or molding, washed and dried in a building resembling a hop oven, and then ground and packed for use.

Madder roots are long and creeping, about as large as a quill, red within and without, and a single plant will, in a good soil, yield about 40 pounds of fresh roots, which will in drying be reduced about six sevenths. Some have dug the roots in two years, but the roots do not then contain the proper quantity of coloring matter; and if they stand longer than three years more is lost than is gained after that period. All parts of the root contain some coloring matter, but it is in the middle part that the most and the best is found, the microscope showing in this part a multitude of shining red particles.constituting the rich dye ing material, thickly dispersed among the fibres.—"According to experiments made in England, five pounds of fresh roots go as far as four of the dry ones; and it is estimated that seven or eight pounds of fresh roots are reduced to one in drying; hence the great advantage of using green roots where practicable becomes apparent. They are more extensively used in a fresh state in France than in any other country, and are there called *alizari*." Good madder when ground for the market is of an orange yellow, passing into a brown red, having an acid sweetish taste and a strong smell.

Some improvements in the culture have been made since it was first attempted here, and if the amount of product per acre may be considered as a criterion, our methods have the advantage over those practiced in Europe. Mr. Woodberry of West Winfield, Herkimer Co. in a letter to the Cultivator, says,—"It is now ascertained that the bes

method of planting madder, is in beds six feet wide, with four rows of plants to a bed, leaving a space between the beds nine feet wide unoccupied; or it may be planted with rows of corn or potatoes the first season. This space is useful for various purposes, as passing with a team to carry manure, should it be considered necessary the first and second seasons. The manure should be dropped between the beds, and mixed with a plough before it is used on the beds." By treating the intervals in this way, Mr. Bronson, a cultivator of madder in the same vicinity, on a few acres of land planted with madder, raised upwards of one thousand bushels of potatoes; and handsome crops of corn have been obtained in the same way. The advantage of planting in beds, arises from the greater extent to which the tops may be covered, as each earthing, properly performed, adds materially to the quantity of the roots produced, the top itself to that extent being, converted into root, and not to be distinguished in its qualities from them.

The following estimate prepared by Mr. Woodberry, and it does not vary materially from those furnished by other cultivators, shows at a single glance the expense of cultivation, and the value of the article produced when ready for market.

Seed per acre 8 bushel at $4, - - -	$32.00
Interest of land 5 years at $40 per acre, - -	11,20
Ploughing and harrowing twice, - - -	2,50
Dressing first year, - - - -	8,00
" second year, - - - -	7,00
" third year, - - - -	3,00
Digging, - - - - -	21,00
Drying 25 cents per cwt. - - -	12,50
Grinding do. do. - - -	12,50
Total expense	$111,70
Product if well cultivated 500 pounds, average price 20 cts. per pound, - - - - - -	$1,000
Deduct, - - - - - -	111,70
Clear profit	$888,30

We have heard but one serious objection made to the culture of madder, and that is, the long time required for its cultivation allows great fluctuations to take place in the prices; and those which may exist at the time of commencing with the plant, cannot be relied on as those which will prevail when the article is ready for market. When we remember, however, that the demand is steady, and increasing; that the quantity produced is not likely to vary suddenly; and that for a number of years the price has ranged between from 17 to 23 cents for good qualities, we think little apprehension need be entertained of an overstocked market, or heavy sales. Seed at the proper seasons, may, we believe, be obtained of the growers in the region we have mentioned, as well as mills for grinding the roots, and we should be pleased to learn that farmers suitably located, had added to their other sources of profit, that of the culture of madder.

Winter Cattle Feed.

[FROM THE FARMER AND GARDENER.]

The indifference which is manifested in every direction of our country towards procuring a supply of succulent food for milch cows during winter, is as cruel as it is impolitic. Without such food to be substituted for the herbage of pastures, it is as impossible that cows can be kept in good order as that they can be kept profitably to their milk upon dry food. Say what we may, the cow that keeps well to the pail during winter must be supplied with *such* food as yields succulent matter bountifully; for without she be so provided, it is utterly impossible that the milk vessels can secrete milk, and for the very obvious reason that they must have something to extract it from. We have often seen a farmer, who, with half a dozen cows to the pail, in winter, did not make more butter and cream than supplied his own table, whereas he ought to have been able, in addition to domestic consumption, to have sent at least 20 lbs. per week to market. If this were an isolated case it would not strike us with wonder; but from its almost universal prevalence, it is at once a subject of regret and mortification —regret that the claims of self-interest and humanity are so shamefully neglected—and mortification that so little regard is paid to a branch of husbandry so intimately connected with human comfort.

With these introductory remarks let us say what are, in our opinion, the best feed for cattle in winter. It is *Mangel Wurtzel*, *Sugar Beet*, *Ruta Baga* and *Pumpkins*. Each of these may, by proper care be provided in ample quantities, without materially interfering with the other farming operations. A single acre planted in *Mangel Wurtzel or Sugar beets*, in rows 2 feet apart, the plants 1 foot asunder, supposing that the beets average 3lbs. a piece, which is a very moderate average is capable of yielding 1089 bushels, which at the rate of a bushel a day to *each* cow, would last 7 cows from the 1st of December till the first of May, and if they get half a bushel a day each, the product of an acre would keep 14 cows in food during the time named. Beets every one know how to cultivate—to wit, that they are to be planted in good deeply ploughed rich loam, previously well manured; that when the beets come up that they may be thinned, cleaned of weeds, and subsequently receive three hoeings and cleanings. This is not more trouble than ought to be devoted to either the culture of corn or potatoes; but how different is the result of product. Of all the articles named by us as proper for winter food, we would prefer the two varieties of beets; but we think that every judicious farmer will at once see the propriety of providing some of all, as there is nothing which so tends to keep cattle in winter, to their appetites, as frequent changes of food; we have frequently seen them reject the same kind of food one day that they had eaten with avidity the previous one, and after an interval of a few days feeding on something else, return with renewed vigor of appetite to that which only a few days before they had loathed.

The following table which we have prepared with care, will show the yield of an acre of beets at the several averages of 3 lbs. 4 lbs. 5 lbs. 6 lbs. and 7 lbs. as the supposed weight of the beets, which we think low, as the highest is not one-third the weight of beets raised by Mr. Pugh of Ohio, the pesent serason. It will also show the number of cows that an acre of ground will sustain for five months during

winter, say from the 1st of December till the 1st of May, at which latter period, the grass will have been so far advanced as to afford a substitute for root-feeding:

Width of Rows.	*Dist. of plants apart.*	*No. of plants on acre*	*Aver'g wgt. of Beets.*	*Prod'ct of acre in lbs.*	*Pro. in tons.*	*Pro. in bush*	*No. of Cows which may be fed at a bush. a day, 5 mos.*	*No. of Cows which may be fed at ½ bush. a day, 5 mos.*
2 feet.	1 foot.	21,780	3 lbs.	65,340	32	1089	7	14
"	"	21,780	4 "	87,120	43	1452	9	18
"	"	21,780	5 "	108,900	54	1815	12	24
"	"	21,780	6 "	130,680	65	2178	14	28
"	"	21,780	7 "	152,460	76	2541	16	32

Now we would respectfully ask if these *averages* are not *low enough* and if they be so, and we think they are, we would ask, if an acre of ground could be put in any thing else that would yield so much solid and nutritious food as either Mangel Wurtzel or Sugar Beet? We unhesitatingly say no, and defy contradiction. And it is greatly in favor of these two varieties of beets, that horses as well as cattle feed upon them not only with avidity, but with decided advantage to health and condition. Why then should farmers hesitate with respect to the propriety of their culture.—Let them, if they choose not to go largely in their growth: begin on a small scale, say half an acre or a whole one, and we will risk the assertion, that they will never omit to raise the *n* again, provided they do these roots justice in their culture; for there is no food which can be given to a cow that contributes so much towards increasing the quantity and quality of both milk and butter.

On Forcing Asparagus.

FROM THE MAGAZINE OF HORTICULTURE.

Asparagus is a hardy esculent vegetable, a native of Britain, and is particularly adapted to this country, not only for its excellent qualities, as an early esculent vegetable, grown in the natural soil, in the spring, but also for its being particularly adapted for forcing in frames, pits, or indeed in boxes, or almost any place or situation, where heat and moisture can be sufficiently applied to cause it to vegetate; and in every case a product will be obtained sufficient to recompense those, who force it, by a pretty general crop, if well managed.

Before I proceed to the management of the forcing of asparagus, I shall point out the method of growing, the roots to be operated upon in a strong vigorous manner, which is one great principle in forcing asparagus, as I do not know of any vegetable that is more susceptible of improvement in cultivation, or one that can be grown in a higher state of luxuriance. The asparagus, in its natural growth and state, is merely a fine grass, springing up in the meadows of Britain; and it might easily be brought to a state of poverty, even in this country, by giving it a poor soil and similar location; and, on the contrary, when the roots (which are fasticulate, and of a nature to easily imbibe any nutriment present in the soil,) are located in a rich soil, the plant naturally becomes of a vigorous, succulent nature, and hence

may be inferred the many different names given to the asparagus—as the *Giant*, large Dutch &c.—which I candidly believe are merely varieties, formed by luxuriance extracted, in the first case, from the soil in which they are planted, and hence their first origin.

The method which I recommend to be pursued for forcing asparagus, is, to grow the roots intended to be forced, from seed sown on a very rich piece of ground, in the middle of October, in rows, eighteen inches apart; the seed bed must be kept well hoed and in excellent order, in the growing season: when the plants have grown an inch or two in height, they will require to be thinned to about six inches apart in the rows, that they may have free access to the *sun* and *air*, to obtain a healthy vigorous state. The second year, in the early part of April, prepare a nursery bed of rich ground, in the best possible manner, into which plant the seedings, in rows, eighteen inches apart between the rows, and twelve inches apart from plant to plant; the planting should not be performed by a dibble, but draw a furrow with a hoe, into which spread the fasticulate roots, in a regular manner. The plants should remain in this place two years, keeping the bed at all times extremely clean, and never cut down the stalks until they are fully ripe.*

Practice of Forcing.—The asparagus may be forced at any time after the stalks are dead, as from that time the roots are in a dormant state, and are only waiting for a congenial temperature and season to start their vegetative powers. In preparing the hot-bed, those materials that will give a moderate and continued heat are the best; oak leaves and good horse manure, mixed together, and worked into a state of fermentation, I should prefer: make a moderate hot-bed of these materials, when well worked into a proper state, by turning and thoroughly mixing together, at different times. When the bed is made place the frame upon it; it may then be well watered, and the frame closed a day or two, to draw up a moist genial heat; about six inches of a light, rich, mellow soil, as leaf mold, or something similar, may then be spread upon it, and the frame again closed, to draw the heat through the soil; this being accomplished, and the bed having a proper temperature, ranging from 46 to 50 degrees, the asparagus roots are to be placed thick over it, and lightly covered with light soil, old tan, or the like, about six inches deep. Great care must be taken, at this period of the operation, that too much heat is not applied to the roots, to start vegetation in too rapid a manner, (one of the greatest and most common errors in forcing asparagus;) therefore give plenty of air during the day, and at night, if there is any danger of its being too violent. If forcing is carried on in severe weather, the bed will require covering with bast mats or hay during the night.

Yours,

E. SAYERS.

Boston, Sept. 14, 1837.

*The only method to obtain good asparagus in any stage of its growth is to place the roots into a rich mellow soil; for they, being of a fasticulate nature, often lose much of their strength and vigor when the soil is dry and poor; and indeed part of them often perish before their proper time, and hence the crown and buds cannot be properly fed. On the other hand, the leaves and stalks of the asparagus are very porous and convey much nutriment from the atmosphere to the roots, and hence the utility of their having free access to it.—E. S.

Bartram, the self-taught American Botanist.

JOHN BARTRAM, the celebrated and self-taught philosopher and botanist, was born in 1704, at Darby, in the county of Delaware, Pennsylvania. His grandfather of the same name, came over from Derbyshire in England, with the adherents of William Penn, in 1682. Early in life he manifested an ardent thirst for knowledge; but the great distance from Europe, then the seat of arts and sciences, and the infant state of the colony, rendered it difficult to obtain even a moderate education. The difficulties of his station, however, yielded to the resources of his own mind, and intense application. Associating with the most respectable characters, he obtained the rudiments of the learned languages, which he studied with extraordinary industry and success. So earnest was he in the pursuit of learning, that he seldom sat at his meals without his book; his victuals being in one hand and his book in the other. He had an early inclination for the study of surgery and medicine, and acquired so much knowledge as to administer great relief to the indigent and distressed in his neighborhood; and as most of his remedies were drawn from the vegetable kingdom, he had an opportunity to prosecute the study of botany, which was his favorite object, together with natural history. Bred a husbandman, he cultivated the ground as the principal means of supporting a large family, and attentive to the economy of nature, and observing the minutest operations, he prosecuted his labors as a philosopher. When ploughing or sowing his fields, or mowing his meadows, his inquisitive mind was exercised in contemplating the vegetable system and animated nature.

He was the first American who conceived and carried into effect the design of a botanic garden, for the reception and cultivation of American vegetables, as well as exotics, and of traveling for the acquisition of them; and for the purpose of accomplishing this scheme, he purchased a plantation in a delightful situation on the banks of the Schuylkill, about five miles from Philadelphia, where he laid out with his own hands, a large garden, containing six or seven acres, comprehending a variety of soils and situations, which he soon furnished with an abundance of the most curious and beautiful vegetables, collected in his numerous excursions in different parts of the country, from the Floridas to the Canadas. Botany being his favorite pursuit, he soon made such proficiency in it, that the great Linnæus said in one of his letters, that he was the greatest natural botanist in the world. His progress in botany, natural history and philosophy, attracted the notice and esteem of the principal literary and eminent characters of America; among whom were James Logan, Esq., Dr. Franklin, and Dr. Kennersley, of Philadelphia, Dr. Colder of New-York, and Dr. Clayton of Virginia; and introduced him to the correspondence and friendship of Peter Collins, Esq., which continued for nearly fifty years, and terminated only with life; Lord Petre, Dr. Dellenius, Dr. Hill, Gronovius, Linnæus, Professor Ralm, Sir Hans Sloane, Mr. Catesby, Dr. Fothergill, Mr. Wrangle, &c., who furnished him with such books, philosophical apparatus, &c., as his genius and situation required, thereby lessening the difficulties with which he had to struggle in a newly settled country, and promoting the object which his benevolent mind had contemplated, in communicating his discoveries

and collections to Europe. These communications occasioned him to be employed in collecting whatever was new and curious, to furnish and ornament the European gardens and plantations with the productions of the New World. His industry and success in the pursuit of science, procured him fellowship in many literary and scientific societies in Europe, as those of London, Edinburgh, Stockholm, &c., and at last he was appointed American Botanist to George the Third, in which appointment he continued till his death, in September, 1777, in the 76th year of his age.

He employed much of his time in excursions through the provinces then subject to England, chiefly in autumn, when his agricultural avocations least required his presence at home. The object of these journeys was to collect rare and nondescript vegetables, fossils, &c. His ardor was such, that at the age of seventy he made a journey into East Florida, to explore the natural productions of that country. His travels among the native Indians were attended with much danger and difficulty, and the different parts of the country, from the shores of lake Ontario and Cayuga, to the source of the river St. Juan, contributed through his hands to enrich and embellish the grounds and forests of Europe with elegant flowering shrubs, plants, and useful and ornamental trees.

He was an ingenious mechanic. The house in which he lived he built himself, after quarrying the stone; and he was often his own mason, carpenter, blacksmith, &c., and generally made his own farming utensils.

His stature was rather above the middle size, erect and slender, of a sandy complexion, and cheerful countenance, with an air of solemnity, his manners were modest and gentle. Amiable of disposition and liberal in mind, he was a lover of charity and social order; and active and temperate, he always maintained a plentiful table; and annually, on New-Year's day, he gave an entertainment at his own house, consecrated to friendship and philosophy. He was an advocate for liberty; and born and educated in the Society of Friends, he led a peaceful, useful, and pious life.—*Southern Paper.*

On Manure for Wheat.

[FROM THE FARMER'S MAGAZINE.]

We can strongly recommend the following paper, on the choice of manure, to the notice of our readers. It is from an able work on the varieties, properties, and classification of wheat, by Col. Le Couteur:

"The effect of different manures on wheat is very remarkable; it will not be necessary to say much on the subject, as it is almost exhausted, having been fully treated by far more able pens; but having made some experiments on the subject, I may be excused from publishing their results.

"I confine my observation to those manures which are within the reach of most farmers, with one or two exceptions.

"Stable manure will, in ordinary good soils have the effect of causing the plants to tiller much, or to make straw and grass, thereby diminishing the produce in grain and meal considerably.

"Liquid manure, one third stable drainings, and two-thirds water, which I caused to be poured once over wheat that was just tillering, made the straw grow rank and coarse, the grain of every variety of wheat was dark and thick-skinned, hence containing less meal. The same quantity and mixture of liquid manure, poured a second time over another portion of wheat, caused it to grow so rank and full of leaves, rather than straw, that only a few of the plants produced ears of wheat, some having run up into sharp points, with merely the rudiments of ears indicated. The few ears that produced corn, displayed in its worst form, hardly in the shape of meal, of a doughy soft texture, evidently unfit for the food of man; besides, some of them were smutty. Thus, an over application of manure, excellent when judiciously applied, becomes a poison, precisely in the same manner as in the human constitution, a surfeit is usually the parent of some disease.

"The wheat on either side of these experiments, which had only been manured with the ashes of kelp, or sea-weed, was healthy, productive, and farinaceous in the highest degree.

"My attention was particularly called to the proper application of manures, by an old and experienced farmer, who considered kelp or the ashes of rock sea weed, that which is cut, the best of all. I am convinced by subsequent experience, that two or three pounds worth of it per acre, spread at the proper period, about two months before sowing time, would always more than repay itself.

"It attracts moisture from the atmosphere, it materially increases the volume of the grain, and fineness of the sample; but does not add to the weight of the straw, though rendering it whiter and more nourishing to cattle. It causes the wheat to assume a rich healthy appearance, and is an excellent application after a crop of potatoes or parsnips, both of which require land to be richly dressed with stable or other strong manure, and has not the effect of decomposing them, as lime does.

"It is also destructive to insects and their eggs, which lie in the soil or turf; it forces the earth-worms and the wire-worms from their lurking places to come to the surface and die; particularly when laid on in a larger quantity than I have named, some farmers being in the habit of putting on double, even treble the quantity above stated—but I believe without having produced proportionably larger crops from inferior land; though it has been asserted that its effect is very permanent, being especially apparent on the succeeding clover crops.

"I am inclined to believe that paring and burning an old ley will almost produce an equally good effect where the land is suited for it; for although the ashes may not be of that superior quality, or possessing all those virtues peculiar to kelp ashes, and the much greater portion of ashes that can by this means be spread on the land may make amends in quantity for quality.

"An additional circumstance in favor of paring and burning is, that all the seeds or weeds, or the eggs and insects which lie concealed in the turf, are thereby destroyed more effectually than by any repeated ploughings.

"The careful experience of five years on this head has convinced me of the propriety of this practice occasionally, especially on ground infested with couch or knot-grass. From three acres of land that had been pared and burned, which produced five hundred and forty single horse loads of ashes, I obtained a very heavy crop of turnips; the following year I raised ninety-one thousand pounds of potatoes, and by

an application of about forty-five bushels of lime per acre, I have since reaped fifty-one imperial bushels of wheat per acre; the straw also was of very fine growth, five feet high, and exceedingly white and bright.

"Kelp ashes should lay on the surface of the soil a month or two previous to sowing time, in order to weaken their caustic power, or they are otherwise apt to burn the young and tender shoots of the corn, as well as the larvæ of insects; but by laying a certain length of time on the surface exposed to the action the atmosphere, or perhaps, what would be better practice, merely lightly turned into the soil, they become eminently beneficial.

"I am so partial to the use of ashes, that I should recommend those who have large woods or forests to employ women and children to collect the dry and broken boughs and under shrubs to be burned for the sake of the ashes, which would be found nearly equal to those of the sea-weed, and besides gaining the advantage of converting what is now wasted, or neglected, into a most valuable and permanent manure, perfectly free from weeds, and destructive to insects and worms.

"Ashes are further beneficial, inasmuch as they attract the moisture from fogs and dews, and retain it a considerable length of time.

"Lime is so well understood as a manure for wheat, that it would be a mere waste of time to say more on the subject than as far as my own experience goes, it appears to impart a greater degree of whiteness to the straw than any other manure. Its other excellent qualities of absorbing moisture from the atmosphere in dry weather, on light or gravelly soils, and increasing the weight of the grain, are well understood; it is to be lamented that some general rule for its application is not made known, as, in the best books I have consulted on the subject, it varies in the extraordinary proportion from fifty-six to five hundred bushels per acre, which last appears to me to be an absurd quantity.

"I have found it to answer perfectly at the rate of forty or fifty bushels an acre on a good loam, and I should apprehend that double that quantity ought to be sufficient for the poorest land, unless it be to destroy moss, when a still larger top dressing is required, which, if well harrowed in, does it effectually. This commixture of turf and lime, if soon after ploughed in, in turn, becomes itself a manure for the very soil the turf previously rendered barren.

"Soot is said to be an excellent top-dressing. I have tried it but once, without having perceived the advantageous results that are said to be derivable from it; it is only in the environs of towns or villages that it can be obtained in sufficient quantity to be available to a large farmer."

PART III.

MISCELLANEOUS INTELLIGENCE.

How to have Roses at Christmas.—Select from your rose tree such buds as are ready to blow; tie a piece of thread round the stalk of each: You must take care not to touch the bud with your hand, or even the stalk any more than you can avoid. Cut it carefully from the tree, with the stalk two or three inches in length. Melt some sealing wax, and quickly apply it to the end of the stalk. The wax should only be as warm as to be ductile. Form a piece of paper into a cone-like shape, wherein place the roses; screw it up carefully, so as to exclude the air from it; do so by each; then put them all into a box, and the box in a drawer, all of which it is intended to keep them from the air. On Christmas day, or any other day in the winter, take them out and cut off the ends of the stalks, place them in a flower-pot, with lukewarm water In two or three hours they will blow as in summer, retaining all their grateful fragrance.—*Old paper.*

The Fruits of Good Tillage.—We remember to have read somewhere, of an old gentlemen who owned a large vineyard. Beside this farm, he was blessed with two daughters. On the marriage of the eldest, he portioned her off with one-third of his farm, and behold the remaining acres produced quite as much fruit and wine as before. Soon after he married his young daughter and gave her an equal dowry with the first, and still the remaining third of his soil yielded as much as his entire original plantation. Good farmers will see no mystery in this. The moral of the story is, that as his farm became smaller he cultivated it more, and the same amount of labor upon a few acres, will make it produce the fruit of many.

There is a great difference between bad tillage and good tillage. Some farmers—no, some earth scrapers, merely scratch up the soil, and dropping their seed haphazard, trust to the change of the season. It is not wondered at, that such tamperers have to scratch hard for a living. We have heard many complain that large farms did not pay the expense of their cultivation—that manure is too expensive to use The earth was therefore lazily scratched up sufficient to destroy the face of the soil, and the seed thrown away upon it. We need not say that such farmers have but little grain to sell, and not much money in these hard times, to put out at interest.

Take another case, however; that of the farmer who makes his farm his pride, who means to show his labor and his skill upon every acre, and mark the difference. The land pays treble value upon its surface for all that has been bestowed upon it. The owner enriches the soil, and the soil in its turn enriches its owner.

Every farmer to make his farm a source of profit, should make it a source of pride. Whatever portion of the soil is cultivated, should be well cultivated. The point should be not to have many, but rich acres. The means whereby husbandry is improved and facilitated, should be studied and employed. By such careful attention, a continual pleasure will be found in agricultural pursuits, which will heighten the rewards of good tillage.—*Germantown Tel.*

Silk Culture in a "Nut Shell."—An Italian gentleman in New-York who has been familiar with all the details of the Silk business in Italy, has published a little pamphlet, giving facts and opinions on this subject. The following paragraph is designed to show how the business may profitably be connected with agriculture, without interfering with the regular industry of the farmer. It is precisely the way it is proposed to introduce it here and render it lucrative in this country—he gives a practical illustration:

"I will take the case of a farmer who owns merely a small house sufficient for the residence of his family, and about ten acres of land. Without the least sacrifice or diminution of the productiveness, if he would merely surround it with a hedge-row of Mulberries, planted with judgment, and according to the best methods, it is certain that it would cost him to do so only a few dollars of expenditure for the purchase of the trees, but the beauty and value of his farm would be immensely improved. At the end of the third year, the trees will have arrived at such a growth, as to furnish leaves in considerable abundance.

"But suppose that they will produce leaves enough only to feed the silk worms from two ounces of eggs, yet such a number if carefully nurtured, would yield at a moderate estimate, one hundred and seventy-five pounds of cocoons, which at 20 cts. a pound, would give a profit of $63 6-100th. The care of so small a number of worms would not be a great burthen to the farmer. One woman, with the assistance of a boy, for the labor of gathering the leaves during five weeks, would suffice. Nor would it be requisite to enlarge the house for the accommodation of the worms. The kitchen or sleeping room, if well ventilated, would be sufficient to contain the worms from two ounces of eggs without inconvenience. The fixtures necessary for the accommodation of the worms, would be so trifling that their cost can scarcely be calculated, especially as this expense would only be incurred in the first year. From this calculation made on an experiment so limited, it is easy to estimate how profitable it would be for farmers and proprietors of extensive grounds to cultivate the silk-worm, where they can have large plantations of Mulberry."—*Hartford Democrat.*

Value of the Willow.—The importance of the willow to man has been recognised from the earliest ages; and ropes and baskets made from willow twigs were probably among the very first of human manufactures, in countries where these trees abound. The Romans used their twigs for binding their vines and tying their reeds in bundles, and made all sorts of baskets of them. A crop of willows was considered so valuable in the time of Cato, that he ranks the salictum, or willow field, next in value to the vineyard and the garden. In France, the leaves, whether in a green or dried state, are considered the very best food for cows and goats; and horses, in some places, are fed entirely on them, from the end of August till November. Horses so fed, it is stated, will travel 20 leagues a day without being fatigued. In the north of Sweden, and Norway, and in Lapland, the inner bark is kiln-dried and ground, for the purpose of mixing with oatmeal in years of scarcity. The bark of the willow, and also the leaves, are astringent; and the bark of most sorts may be employed in tanning.—*Arboretum Brittanicum.*

Preserving Pumpkins.—A correspondent at Union Bridge, Maryland, under date of May 9th, says—"In looking over the Farmers' Cabinet to-day, I find a request from one of your subscribers, for information as to the best method of preserving pumpkins through the winter. I answer, that the way to preserve them one or more years, is, to pull them before the frost comes on, and keep them in a warm dry room. This is my method, and I have now several large ones in my house, in a fine state of preservation; and my neighbor, Mr. Davis Lightner, one of your subscribers, has them two years old at this time, weighing 43 lbs. each. They are very fine.

An extraordinary mode of Hatching Chickens.—No one, whilst at Ghizeh, should omit seeing the chicken *manufactory*, where two old men perform the maternal duties of as many thousands of the gallinaceous tribe. The eggs are spread out on a flat surface of clay, in ovens, kept of course night and day at a uniform degree of heat. The old men visit their charge constantly, turning the eggs with long poles, so as to bring every part of their surfaces in occasional contact with the clay bottom of the oven, which is somewhat warmer than the atmosphere. It is an extraordinary sight! Every instant some little animal, in his struggles to enter this world of troubles, bursts its shell, and starts into life, (an orphan from his birth!) keeping the surface in a constant state of *agitation.*—They are immediately taken out of the oven, placed in baskets, and sold by *measure*—every old woman in the neighborhood buying a pottle of the miserable little creatures to take home and dry nurse, until they are of an age to shift for themselves. I believe this method of hatching chickens is common throughout Egypt, although I cannot state on my own authority, that such is the case; if so, it may account for the degeneracy of the breed of fowls, for they are invariably small, though the eggs are not much less than those usually met with in other countries.—*Scott's Rambles in Egypt and Candia.*

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